THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. VIII. Nº 174—11th YEAR.] LONDON, JUNE 21, 1859. [Subscription per Ann. 15s. in Advance 18s Credit. DOUBLE No. Price 1s.

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R. P. SPICE, Engineer.

Richmond, June 20, 1859.

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THE Directors of the Tunbridge WELLS GAS COMPANY will be prepared, on Wednesday, July 13, to receive TENDERS at per Ton from parties willing to supply and deliver 2000 tons of HARVEY MAIN GAS COALS, weighed on the Gas Company's weigh-bridge, and delivered into their stores Tunbridge Wells, in the following manner:—

400	tons during	August,	1859
400	,,	October,	,,
200	,,	November,	,,
200	,,	December,	,,
400	,,	January,	1860
400	,,	March,	,,

but the Directors shall have full power to postpone for a month, in each or every case, the four last-named periods.

Tenders to be sent to the Office of the Company, Tunbridge Wells, by six o'clock, p.m., on Wednesday, July 13, marked "Tender," and addressed to the SECRETARY, of whom any further particulars may be known.

The Company reserve to themselves the power to reject any Tender.

By order,

JOHN READ, Secretary.

Tunbridge Wells, June 15, 1859.

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Tubes of all kinds, with or without Flush Joints, for Artesian Wells, and general Boring Stocks, Taps, and Dies, Boiler-Fittings, Brass Cocks, &c.

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JOURNAL OF GAS LIGHTING ONE PENNY NEWSPAPER

MEDALS AWARDED TO
THOMAS GLOVER'S
PATENT DRY GAS-METERS.

THOMAS GLOVER,

PATENT DRY GAS-METER MANUFACTURER,

SUFFOLK STREET, CLERKENWELL GREEN, AND
ALLEN STREET, GOSWELL STREET, E.C.

LONDON, March 25, 1859.

THOMAS GLOVER takes this opportunity of thanking Gas Companies and his other Customers for the very liberal support and patronage he has received during the past year, which has far exceeded his most sanguine anticipations, having sold a greater number of his PATENT DRY GAS-METERS since the dissolution of his partnership with Mr. Croll than he was ever previously enabled to do in any one year.

THOMAS GLOVER confines his sole attention to the business of Gas-Meter Making. The propriety of his doing so is satisfactorily proved by his success; and, without the practice of any quackery, or any attempt to delude the public by an absurd exhibition of "Old and New Valves," his Meters are in general use by the Metropolitan Gas and other Companies in this Country and abroad. For example, one Metropolitan Company have now in use above **12,500** of his Patent Dry Gas-Meters; some of these Meters have been fixed for Fourteen Years, and are still in working order, without complaint from either the Company or the Consumer.

THOMAS GLOVER thinks it necessary to put Gas Companies on their guard against parties selling Patent Dry Gas-Meters constructed in imitation of his, but unskilfully made on erroneous principles, and with improper and unsuitable materials.

THOMAS GLOVER'S Workshops are now the most extensive in this or any other Country, and he is thereby enabled promptly to execute orders to any extent required. Purchasers may at any time inspect his Works and the Materials of which his Meters are constructed. He is ready to enter into Contracts with Gas Companies and others to uphold their Stock of his Meters for Twenty Years at an annual charge varying from $2\frac{1}{2}$ to 5 per cent., and to leave always in the hands of Gas Companies Three Years' charge for upholding, as a guarantee for the fulfilment of the Contract.

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and they consequently register the quantity of Gas consumed with greater accuracy than Meters in which the Water-Line is variable.

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N.B. The Patent Self-Adjusting and Compensating Apparatus may be applied to the ordinary Meter.

Manufacturers of LOWE'S PATENT MOTIVE-POWER METER, for situations where there is an inadequacy of pressure to supply the special requirements of certain consumers in low grounds during the day or night.

Also, Manufacturers of EXPERIMENT METERS, GASHOLDERS, GOVERNORS, MINUTE-CLOCKS, PHOTOMETERS, &c. &c., similar to those used by Mr. King, of Liverpool.

EXTRACT FROM THE REPORT OF MESSRS. LOWE, KIRKHAM, PEARSE, AND BARLOW, ON CROSLEY AND GOLDSMITH'S PATENT METERS.

Our experiments lead us to the conclusion that the patent meter is a practical and substantial improvement upon the ordinary wet gas-meter, inasmuch as the capacity of the measuring chamber is not diminished by an excessive supply of water, nor can it be increased by drawing off water. On the one hand, therefore, the consumer is protected against any intentional or negligent overfilling of the meter, the result of which is to exaggerate the registered quantity of gas actually consumed; and, on the other hand, the gas manufacturer is protected against the fraudulent abstraction of water by the consumer, the effect of which in the ordinary meter is to cause it to register less gas than is really supplied. Time alone can determine whether these advantages are gained at the expense of its durability, or by any complexity which may render its utility doubtful; but, so far as we are able to form an opinion upon these points, the patent meters are not liable to any greater derangement than the ordinary wet meters, nor do we believe they will be less durable.

(Signed) GEORGE LOWE, *C.E., F.R.S., Engineer-in-Chief to the Chartered Gas Company.*
JOHN KIRKHAM, *C.E., late Engineer-in-Chief of the Imperial Gaslight Company.*
GEDDIE PEARSE, *late Engineer-in-Chief to the Incorporated and Provincial British Gaslight Companies.*
THOMAS G. BARLOW, *Civil and Consulting Gas Engineer.*

LICENCES GRANTED TO THE TRADE ON MODERATE TERMS.

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NOTICES.

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THE JOURNAL OF GAS LIGHTING, WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, JUNE 21, 1859.

NOTES UPON PASSING EVENTS.

AND so the whirligig of time has again brought the *doctrinaire* bureaucrats into power! Well: it must be supposed that such men as these represent to some extent the spirit of the age which they are allowed to lead, and in due courtesy to them it is but fair to suppose that they are conscientious in their advocacy of certain opinions and of certain systems of administration; so that the only course which seems open to the upholders of the opposite principles, which have made the glory and strength of our country, is to endeavour to enlighten the public mind as to the real character of the measures proposed by their mistaken friends. How is this to be done effectually? How are the dangerous experiments upon our constitutional and our local institutions, with which we are threatened by the accession of Lord Palmerston and of his friends to power, to be most effectually resisted? How are the rights of Private Enterprise to be protected against the extension of the mischievous and vexatious interference of the Central Administration, which has of late years so markedly characterized the policy of the so-called "liberal" statesmen of England? These are grave questions; but they are forced upon the public mind by the present state of the political world, and they must be solved by those who have an interest in the continued prosperity of our country.

Indeed, the accession to office of such men as Lord J. Russell, Lord Palmerston, Sir G. C. Lewis, and even of Mr. S. Herbert, must convince any one who has studied the theory and the practical working of the administrative measures with which their names have been connected, that the system of extending the power of the Central Administration at the expense of local and individual action will soon be revived; and that public companies, such as Gas and Water Companies especially, will again be exposed to the attacks of Government functioneers. There was no abuse connected with the late General Board of Health, no ridiculous nonsense propounded by its underlings, which Lord Palmerston, and, on an occasion, Sir G. C. Lewis, were not prepared to defend. Lord J. Russell also, with respect for the Constitution always on his lips, has for a long period identified himself with the extension of the bureaucratic spirit of the Chadwickian school; whilst the Peelite party, so well represented by Mr. S. Herbert, simply repeat this bureaucratic tendency under another name. Messrs. Cobden and Milner Gibson, again, are far too deeply connected with the socialist Manchester school to be at all likely to oppose the application of the doctrines which justify the sacrifice of private rights to public advantage, real or imaginary; whilst it is notorious that Mr. Lowe has been a party to every measure involving the destruction of the private property likely to interfere with the interests of the Corporations, or of the branches of the public Administration, he defends. It is true that the presence of the Duke of Somerset in the Cabinet offers a species of guarantee against the immediate application of the Chadwickian socialist principles; but he, unfortunately, stands nearly alone, and unless his hands are strengthened by an energetic union of the parties whose interests are threatened, and whose rights are almost sure to be attacked, his power of resistance will soon be destroyed. Most earnestly, therefore, do we urge the manufacturing and industrial classes of our country to organize at once some permanent system for watching the conduct of their dangerous enemies who are now in power, and of efficiently resisting the changes they are likely to introduce in the social arrangements of England.

We cannot close the short remarks we feel called upon to make upon the present unsatisfactory position of political affairs, without expressing the sense of bitter regret all properly constituted minds must have experienced on account of the reasons which made Lord Campbell's nomination to the Woolsack almost a matter of party necessity. The private characters of public men are fortunately treated with great tenderness and discretion in this country; and even they who have led very equivocal lives in their youths, at times are supposed to become "men of God" in their old age. But it is hitherto unprecedented that the Whig party should be compelled to confess that it could not number in its ranks one man who was fit by his previous education and experience to preside over the Courts of Equity, and to appear amongst the more respectable classes of society. There are tales afloat with respect to the men who were supposed to have been originally proposed for some of the higher legal appointments of the present Administration, and, alas! also with respect to some of the leaders of the late Government, which, if true, would appear to prove that our political world is rapidly approaching to the state of demoralization which rendered inevitable the last French Revolution, by superinducing in the public mind a disgust with the whole governing class. *Absit omen!* Most devoutly do we hope that the instances of personal inaptitude for high and responsible positions to which we allude, may be only exceptions to the general rules adopted in our political society; but it is to be feared that even the silence and the discretion with which these things are generally treated, indicate the conviction that it would be useless to attempt to alter them.

In the more immediate sphere of our observations very little has passed of late worthy of remark. The public authorities, it is true, have begun to move in the matter of the revolting state of the Thames; but the lessons of previous years seem to have been productive of very little benefit to them. Instead of recognizing at once that the present evil has arisen from the injudicious extension of the water-closet system, before the introduction of an efficient method of disposing of the refuse from the sewers, and that, temporarily, the only mode of preventing the contamination of the River Thames was to apply a system of disinfection at the mouths of the minor sewers, the Metropolitan Board of Works, and the City Commissioners of Sewers, appear to have contented themselves with obtaining elaborate Reports as to the physical conditions of the Thames waters. Such an investigation was, no doubt, required, but it was only so required as furnishing sure indications for the practical measures to be adopted; and at any rate the success of the processes actually employed to abate the nuisance produced by the continually increasing contamination of the Thames at the end of last summer, ought to have led to their renewed application now that the evil has recurred with its former violence. The worst part of this story is, however, that our purblind sanitary authorities will not see that the course they are elsewhere urging the municipal bodies under their influence to adopt must, sooner or later, convert every natural watercourse or drainage outfall into a nuisance of the same description as the Thames; and that a compulsory

system of disinfection, at the points of discharge of town sewerage, is even more necessary than a compulsory system of house sewerage. It is not in London alone that this lesson may be read; but it seems to be read in vain to the men who are, it is to be feared, more anxious to secure patronage and power for themselves than they are to advance the true interests of society.

By the way, there was a very fine joke played off upon the high priest of functioneering humbug, Mr. E. Chadwick, on the occasion of the last elections, to which we cannot refrain from alluding even at this remote period. It seems that some wicked wag, who was cognizant of the manner in which petitions for the application of the Public Health Act were concocted in the palmy days of the late General Board of Health, made up a requisition to the worthy C.B., the Director of the London General Omnibus Company (Limited) above mentioned, inviting him to stand for Evesham. "Nothing," says the proverb, "is more easy than to deceive an habitual deceiver;" so Mr. Chadwick swallowed the bait, and contested the somewhat rotten borough in question. On going to the poll, however, the hero of the Andover Union only had 49 votes; and on inquiry it is said that he has discovered the joke thus fastened upon him. Thereupon great wrath ensued, and threats have been uttered of prosecution for fraud, &c.; to which the reply has been, always according to public rumour, that if Mr. Chadwick should begin any proceedings of this description, very awkward revelations would be made as to his conduct when in office with respect to the manufacture of other petitions. We do not guarantee the truth of this story, be it observed—*ma si non è vero, è ben trovato.*

Will that very flaming patriot Mr. Leslie, who was so prompt to attack the reputations of the servants of the Metropolitan Board of Works, allow us to suggest to him that it would be desirable for him to examine narrowly the conduct of the parties employed by the Local Board of which he is so distinguished a member? It happens that in the discharge of our own professional duties we have been made painfully conscious that the scavengers appointed by the parish of St. George's, Hanover Square, neglect to clear out the dust-bins of those parties who do not bribe them to fulfil the duties they have contracted to perform. Complaints to the Local Board on this score seem to be useless; and so Mr. Leslie's clients are taxed for parochial purposes, and then have to pay a species of black-mail to the parochial contractors. Surely Mr. Leslie, who is so prone to bandy accusations of swindling, ought to inquire into these matters affecting the reputation of the body to which he himself so directly belongs.

There have been of late some decisions in the Law Courts of a very interesting character to the persons connected with water privileges, to which attention may here be called. The first is the decision in the case of *Canon v. Sinclair*, in which Lord Campbell, in conjunction with his legal brethren, ruled that the boundaries of a parish on the banks of a river extended, unless under exceptional circumstances, "*ad medium filum aquæ;*" and that, therefore, the parish of Rotherhithe was entitled to rate landing stages, advancing beyond the banks of the river, for parochial purposes. The second of these decisions is the one given by the Judges, through Mr. Justice Wightman, when consulted by the House of Lords in the appeal case of *Chasemore v. Richards*. The principle laid down by Justice Wightman is, in fact, the same as that laid down by C. J. Tyndall in the well-known case *Acton v. Blundell*, viz., that it is for the interest of society that every man should be entitled to deal with the water he may find below the surface of his own land as he may think proper. As a general principle this may be true; but it is subject to such very peculiar exceptions that we propose to return to the examination of Justice Wightman's decision as soon as it is published in detail. Possibly the case which is now pending between the Stourbridge Canal Company and Lord Ward, even though complicated by the (so to speak) statutory existence of the Company, may throw some reflex light upon the subject; and we shall therefore watch its issue with interest. The third decision to which we allude is the one given in the appeal by Sir M. Peto against the mode of rating the Victoria Docks, and it is important to Water Companies, in so far as it sets at rest the question as to the mode of rating Reservoirs. In the case of the Victoria Docks it was held (we must say, that we think, very correctly) that the basins were "property other than land;" and, as such, that they were liable to higher rates than the mere agricultural land they replaced would have been. If the Directors of the Dock Company had maintained their position, it would have been difficult to have established any distinction between the rateable character of their basins and that of an ordinary canal; and thus their ground of appeal, in fact, raised the question as to the principle to be followed in assessing the rates of a very much larger amount of property than was supposed to be involved.

Some time since a very fierce controversy arose between the self-constituted statistical and sanitary authorities of the Registrar-General's office on one side, and the officers of the Corporation of Liverpool on the other, with respect to the alleged excessive mortality of that town; and our readers may recollect that the said Officers communicated to the itinerant social science mongers a rather bitter reply to Dr. Greenhow's very equivocal deductions from the returns he had consulted. At the time that this reply was read, Lord Shaftesbury, as president of the public health section of the Association, requested that it should be printed, and "a copy thereof (sic) forwarded to the authorities of the principal towns of England, and also widely distributed." It would seem that this request has been literally complied with; and that the one copy asked for, has been making its tour through the widely distributed towns of England; inasmuch as the paper read at Liverpool on Oct. 15, 1858, has only reached us on June 11, 1859. But without dwelling upon this extraordinary delay, or upon the singularly bad grammar of Lord Shaftesbury's resolution (which, by the way, is fairly matched by the bad grammar of the last Queen's speech, or by that of Lord Redesdale's bill for "regulating measures! used for sales! of Gas"), we would observe that both the original accusation of Dr. Greenhow, and the reply of Messrs. Newlands and McGowan, are of a nature to inspire anxiety in the minds of those who are not content to rest satisfied with the appearances of things irrespective of the existence of the things themselves. For the style of reasoning to be met with in Dr. Greenhow's paper so closely resembles that to be met with in other official documents, that it must be a source of anxiety to all true lovers of our ancient institutions to see that the power and influence of the Government have fallen again into the hands of a body of men, so utterly deficient as these are, of all true notions of logic, applying that word in its true sense of "the right use of reason." Messrs. Newlands and McGowan, indeed, prove very clearly that Dr. Greenhow knew nothing whatever about the subject he pretended to discuss, and that he had made blunders of the most ridiculous description. Of course this was to have been expected from official science, and it would for its own sake hardly have been worthy of notice; but what strikes us as being the most serious inference to be drawn from the discussion before us, is that the shrewd inhabitants of Liverpool, like too many of the other inhabitants of our industrial districts, have adopted as social truths the very mischievous doctrines that the public authorities are bound to interfere to protect those who are not willing to protect themselves. It appears to us, indeed, that the Corporation of Liverpool has enforced the performance of the duties of property, with as little respect for its rights, as even Mr. Chadwick himself would have desired; and really it seems to us that the great quarrel between the Corporation of Liverpool and the friends of the Registrar-General, lies rather in the fact that the latter have ignored the proceedings of their fellow-socialists, than that there is any substantial difference between them. And so there will be a Peachum and Lockit reconciliation between the antagonists; and some public company, or some class of private interests, will no doubt be sacrificed on the occasion! The result of the publications we have hitherto received is, however, to show that for the present the sanitary state of Liverpool is superior to the one which formerly existed, and that the mortality of that town is less than the mortality of other towns of a similar description. The evil which we fear has been created by the recent proceedings of the Corporation is that they have taught the labouring classes to cast all care and forethought for their own interests upon society in general.

At Rugby we find that not only have the boasted water-works failed, but that there seems to be a probability that the boasted sewerage irrigation works will involve the town in litigation; indeed, so evident does the failure—commercially—of this mode of disposing of the sewerage seem to us, that we should not be surprised at any time to hear of the tenant's throwing up his lease. It appears, also, that of late the mortality of Rugby has considerably increased; so that even after Sanitary works of the most approved pattern have been executed for years, it

is possible that no substantial benefit may be conferred by them, adequate at least to their cost. *Respice finem.* Wait, good people of Ely, before you boast of your great doings; and, above all things, recollect that to discharge your sewerage into any natural watercourse, without deodorization, is simply to lay up stores of future epidemics—"filth fevers," to use modern slang. It happens that in the case of the town of Bury St. Edmunds the neglect of every description of sanitary precautions has just at this period produced an outbreak of fever which is, we suspect, of a typhoid character. The inhabitants seem to be seriously alarmed, and to be about to adopt some energetic measures for dealing with their present evil; but, unfortunately, they have been misled by the official praise of the Ely works, and are, therefore, likely to content themselves with merely casting upon their neighbours the duty of removing the sewerage of the town. We warn them at once that such a course would be both impolitic and unjust—impolitic, because any increase in the contamination of the natural watercourses of the district by their act will expose them to long and costly litigation, in which they are sure ultimately to lose; unjust, because a body corporate has no right whatever to commit an act which may become a private or public nuisance. The people of Bury St. Edmunds should learn, from what occurs in the immense mass of water in the Thames, that the removal of foul matters from houses by means of drains and sewers, of however an impermeable nature they may be, is far from being all that is required; and that even a water supply and a complete system of sewerage are not sufficient to insure the health of a town unless the sewerage at its outfall be prevented from becoming a source of annoyance and disease.

In one of our last numbers we alluded with satisfaction to the introduction into the Canadian Legislature of a measure to compel the fulfilment of municipal obligations; and, on looking over a file of recent American papers, we have met with another proof that the doctrine of repudiation, so much in fashion amongst the drab-coloured inhabitants of Pennsylvania in former times, is now looked upon with disfavour by our Transatlantic brethren. It is stated that the citizens of the towns of Davenport, Keokuk, and Dubuque, Iowa, have lately agreed to put a stop to the lighting of their streets with gas, in order to devote the money thus saved to the payment of their debts. Now this, we must confess, seems to us to be very honest, but not very wise; and we think that the inhabitants would have done better to have submitted to greater taxation, rather than to have destroyed partially their means of paying taxes by annihilating the business of the early hours of the evening. There may be reasons, unknown to us Britishers, which render the course pursued by the wise men of the West—the Iowa magnates—more rational than it appears at the first blush; but at any rate the tale is interesting, insomuch as it proves the spread of the anti-repudiation doctrines. Now that our capitalists are unable to invest their money upon the continent of Europe, it may be a matter of interest thus to call attention to the dawn of a better state of public morals in the United States; for it is notorious that the insecurity of the local debts of the separate States and of local corporations has latterly materially retarded the development of that country.

THE COMMISSIONERS OF SEWERS AND THE CITY OF LONDON GAS COMPANY.

On the 7th inst. the Commissioners of Sewers met for the ordinary despatch of their business, and a long discussion ensued, to which the attention of our readers is particularly directed. In the first place, Deputy Harrison and Mr. De Jersey felt it to be incumbent upon them to set themselves right with the public on the score of the private character they have lately endeavoured to give to the proceedings of their Court; and, in the second place, the members of the Corporation who have taken part in the establishment of the Great Central Company, have thought it advisable to offer some sort of explanation of their conduct. There was a marked deference to public opinion in both these proceedings, such as must inspire confidence in the ultimate establishment of correct principles in the management of the business of the Corporation; but, although the publicity to be hereafter given to the proceedings of the Commissioners of Sewers in their transactions with the Gas Companies may thus prevent any future conduct by the Corporation authorities, similar to that which has given rise to the accusations urged against the Commissioners themselves, no answer has yet been given to those accusations.

For Deputy Harrison must have been perfectly well aware that the *gravamen* of the charge urged against him and his friends, was that they had abused their power, or had consented to its abuse by their servants, in order to advance the pecuniary interests of one of those servants. It has been stated over and over again that the Great Central Gas Company was established under assurances as to the future price of Gas which are now admitted to have been fallacious, in order to secure the payment of a species of royalty on the quantity of gas sold by the new Company to Mr. C. Pearson, the City Solicitor; and, further than this, it has been asserted that the Commissioners of Sewers, who must have been cognizant of the existence of the bargain by which that royalty was secured, and thus lent their hands to it, have subsequently used their power and influence to persecute the Company which was in the most direct opposition to the one they patronized. The accusation, in fact, was that there had been a breach of fiduciary trust by the City Solicitor, and that the Commissioners have knowingly closed their eyes to the existence of the said wrong. Yet, on every occasion when the questions connected with the various City Gas Companies have been brought before the Commissioners of Sewers, the nature of the bargain made by Mr. Pearson has been studiously kept out of sight, and no attempt whatever has been made to justify, or exculpate, the members of the Sewers Court from the accusation of connivance with that bargain. Public men must recollect the old tale about Cæsar's wife; and they must not only be innocent, but they must not even appear to be guilty. Deputy Harrison and his friends must, therefore, grapple at once, and distinctly and openly, with the charge made against them, unless they are prepared to accept the moral responsibility of their agent's proceedings. The anxiety with which every allusion to the bargain made by Mr. Pearson has been suppressed in the recent discussions before the Commissioners of Sewers, causes us to fear that, unless a very strong pressure from without be applied, no real explanation of the circumstances attending the conclusion of that bargain will be obtained. As Mr. Causton observed in another matter, so long as an examination of these charges is avoided, so long will it be suspected that there is some influence at work to prevent the Commissioners of Sewers from acting with impartiality; especially as the observations of Mr. De Jersey would lead to the inference that the parties who wield that influence are as unscrupulous in their mode of using it at present as they were at any former period.

It must naturally be a source of gratification to ourselves to find that the parties connected with the Great Central Gas Company have at last discovered that we were quite correct when we stated that it was impossible to make and sell gas at the rate of 4s. per 1000 feet, with a legitimate profit to the shareholders. The obloquy which has been thrown so unsparingly upon the old companies is thus proved to have been undeserved; and we are also glad to perceive that the disappointment created by the false representations of the advocates for cheap gas is producing a reaction in favour of those whom they had attacked. One effect of this reaction seems likely to be, that negotiations may be commenced between the various parties who are now concerned in the opposition to the bill before Parliament for a renewal of the powers of the City Gas Company, which may lead to a fair solution of the difficulties of that particular case.

It seems indeed to us, and we speak in our own name, because we desire simply to express a personal opinion, to be taken for only just so much as it is worth, that it would both be possible and desirable to make some arrangement, by means of which the supply of gas to the central and eastern parts of London might be consolidated, under such circumstances as to allow the transfer of the works of the City Gas Company to a more unobjectionable position than the one they now occupy, whilst the rights of the proprietary of that Company should be respected. As to the injury which Gas-Works effect in a sanitary point of view, we believe that the assertions of Dr. Letheby and of the writers in the *Times* are gross exaggerations; and that, although the existence of such establishments in the heart of the City may be occasionally very unpleasant, it by no means follows that they sensibly affect the public health. But evidently it cannot be desirable to retain near the centres of business, factories which are thus always exposed to obloquy and attack, whether justified or not; and the extreme precautions which must be taken to conduct such factories in a manner to avoid the creation of a nuisance, must increase the cost of the manufacture itself. It is, therefore,

solely as a question of policy that we think the removal of the City Gas-Works should be considered; for again do we assert that we are convinced that no overwhelming necessity for such removal exists, and that the species of sanitary alarm which has been raised on the subject is based upon a mistake, even if we interpret the conduct of its originators in the most favourable sense. In fact, we believe that it would be possible to remove the works of the City Company to a position wherein they should be free from the incessant attacks to which they are now exposed, and where they would be able to make gas at a lower rate for working expenses than they do at present, without entailing a first outlay of a nature to burthen that operation with an overwhelming charge. An increase in the price of gas to the extent of 6d. per 1000 cubic feet would, we believe, suffice to cover all the expense of removal, if guaranteed for a lengthened period; and as it is inevitable that, sooner or later, the pretence of selling gas with profit at the rate of 4s. per 1000 must be abandoned, it seems to us that an earnest effort should now be made to concentrate the operations of the principal Companies which supply the central and eastern districts of the Metropolis, so as to allow of their simultaneously setting this question of price on a proper footing, and of their concentrating their operations in a place free from the objections which will always be urged against Gas Factories established in densely-peopled neighbourhoods. It is only as a question of policy that we hold the removal of the City Gas-Works should be considered; and that question, we repeat, must be treated with liberality, and with justice to the position of the proprietary of that Company.

It is important to observe, whilst dwelling upon this part of the discussion raised by the present relations between the Commissioners of Sewers and the City Gas Company, that the result of the great experiment lately tried in Paris, in the course of which the works of the separate Gas Companies were concentrated, and removed from the densely-peopled parts of the town, has been such as to prove that the ultimate cost of such removal is of a far less serious amount than is usually believed here. It will, however, be attended by a considerable outlay; and this must be met by the gas consumers of the Metropolis, who after all need not be called upon to pay more for that necessity of our modern civilization than the article itself merits. Of course, the mode of conciliating existing interests must form the subject of long and anxious consideration; but it is satisfactory at least to find that public opinion is taking that direction which may render it possible to arrive at a conclusion which may satisfy all reasonable persons. The first condition for so doing is, however, that every improper influence upon the public authorities should be removed. Unfortunately there seems to be an indisposition to deal frankly and fairly with this part of the question; and even now Deputy Harrison and his friends will discuss everything connected with the past history of the Great Central Gas Company excepting the accusation that their conduct in persecuting the City Gas Company, with the acrimony they have in fact exhibited, was influenced by their connivance with the City Solicitor in his bargain with the originators of the Great Central Company. We should have had far more confidence in the future conduct of the City Commissioners of Sewers, if we had found that they were anxious to assist an inquiry into the matters so often brought before their notice, and hitherto so skilfully avoided. As it is, Deputy Harrison has dwelt upon the unimportant objections made to the conduct of his court; the most important one he has discreetly left unnoticed; and, for the present at least, he must not be surprised if the purity of his motives in conducting the opposition to the City Gas Company's Bill should continue to be suspected. With Sir G. C. Lewis as Home Secretary, it behoves the Corporation of London to be especially careful; and to avoid anything like a justification for the interference of the State in its affairs.

In the *Times* and other daily papers of the 20th instant, Mr. C. Pearson has personally interfered in the discussion between the Corporation authorities and the City Gas Company, by means of a letter and an advertisement, which are characterized by a degree of bad taste and unblushing insolence hardly to have been expected from that gentleman himself. It would lead us, however, much farther than we are at present able to go, were we to reply at once to the false assertions and the manifestly unjust assumptions of the singular document put forward as containing the reasons to be alleged against the second reading of the City Gas Company's new Bill. Perhaps, also, the proper place to discuss these so-called reasons would be the Select Committee Room of the House of Commons; and though, no doubt, the Corporation influence will be brought to bear upon the new Government in an unfavourable manner to the Company, we can hardly suppose that even a modern Parliamentary Committee will be able to refuse an impartial investigation into the merits of the case—it may even be that the past conduct of some of the movers in the present agitation may thus be brought to light.

Circular to Gas Companies.

The reassembling of Parliament has produced a movement amongst the metropolitan and large provincial gas companies, the object of which is to concert measures for the protection of their interests in any legislation that may take place with respect to the inspection and testing of gas-meters. We believe a deputation has waited upon Lord Redesdale, to which he has intimated his readiness to take into consideration any suggestions gas companies might offer; and an eminent parliamentary counsel has in consequence prepared such clauses and amendments upon the original bill as will give the fullest security to the public for the accuracy of the registration of the meters, while the machinery by which the bill is to be worked will be simple but effective. In the meantime, the progress of Lord Redesdale's bill will be suspended, and it may finally give way to a more practicable and efficient measure.

The second report of the managers of the metropolitan gas inquiry has been issued, giving an account of their own proceedings, and of the proceedings before Parliament from November last to the commencement of the present month. Most of the circumstances reported are already known to our readers, though some of the communications between the managers and the sub-committee appointed to confer and advise on suggestions for a settlement, are now made public for the first time, and an explanation is given of the many discussions that occurred in the committee with closed doors. It appears that Mr. Locke and Sir John Shelley, the two members of the sub-committee appointed on the part of the managers, in the first instance held a conference with the deputies from the south side of the Thames to consider the maximum price to be insisted on, at which meeting Sir John Shelley "distinctly stated that 4s. was an impossible price to be obtained as a maximum." At a meeting of the members of the sub-committee held subsequently, at which Mr. Russell and Sir W. Hayter, who acted on behalf of the gas companies, were present, the companies "were understood to agree to the maximum price of 4s. 6d. in connexion with a clause empowering the Board of Trade, on sufficient cause being shown, to allow the price to be raised." When the parliamentary committee met to proceed with the inquiry, they deliberated for two hours with closed doors on the question of the standard of illuminating power, and Sir J. Shelley, we are informed, during the discussion conferred with the managers, and desired them to state definitively whether they would accept a less illuminating power than 12 sperm candles, at a maximum price of 4s. 6d. That proposition not being assented to, and the gas companies being disinclined to make further concession, the committee determined to hear evidence, and Mr. Hughes was called in. The result of that gentleman's evidence at the end of two days' examination, it is well known, completely destroyed the case it was intended to establish; nevertheless, the managers, in their review of the proceedings, "confidently submit that *a certain portion* of their original allegations has been distinctly confirmed"—alluding more particularly to an increased charge for public lighting, and the reasonableness of a maximum price of 4s. 6d., and a standard of 12 sperm candles. It did not, however, require two days' examination to confirm those points, for the first one was an undoubted fact in some districts of the metropolis, and as regards the latter, to establish the reasonableness of a charge of 4s. 6d. for that quality of gas, was direct evidence in favour of the metropolitan gas companies, who have for several years supplied their customers at that price, with even a better quality of gas.

The fourth and fifth meetings of the committee, when they sat with closed doors nearly the whole time, are stated to have been occupied with angry discussions, during which twelve divisions took place; and that on the fifth day three of the members who represented the interests of the delegates on the committee informed the managers that the representatives of

the gas companies had agreed to all the clauses as modified in the sub-committee, excepting the standard of illuminating power, which they proposed to make eleven sperm candles for common gas, and sixteen and a half for cannel gas, and that they insisted also on fixing the distance between the public lamps at sixty yards, instead of one hundred, as proposed. The committee, it will be remembered, determined not to hear further evidence until the parties were represented by counsel, and the approaching dissolution having put a stop to all further proceedings, it was decided to print the evidence, as far as it had gone, in a Blue-Book. That book did not make its appearance till Saturday last, but the managers refer to the report in the JOURNAL OF GAS LIGHTING as being, "with some few glaring exceptions," tolerably correct.

After the experience which the managers have gained during the two last sessions of Parliament, they have wisely determined to have no further inquiry. The "certain portion" of their original allegations which the evidence confirmed is so small, compared with the larger unmentioned portion, which completely contradicted them, that they eschew evidence altogether, and desire to embody their allegations in the preamble of a Bill which they have resolved to introduce into Parliament. In the contemplation of thus having free scope for the outpouring of their allegations without examination, the managers grow bold, and notwithstanding they inform us that all differences with the gas companies had been arranged, with the exception of one candle in the illuminating power, they now open again the whole question of districting arrangements, of competing gas-works, the regulation of lighting and extinguishing the public lights, the removal of existing gas-works from the midst of populous districts, and they repeat a number of previously refuted statements respecting the exorbitant charges for public lighting. The managers have, however, referred the preparations for drawing the bill to Dr. Bachhoffner, whose recent experience leads him to declare that he "conscientiously believes that it is impossible to manufacture and sell pure gas at less than 4s. 6d. per 1000 cubic feet," and to Mr. Hughes, who stated in his evidence that the gas consumers of the metropolis whom he represented are perfectly satisfied with the price and quality of the gas supplied to them. If those gentlemen be not restricted in the exercise of their power in drawing up the preamble of the bill, it must necessarily be very brief, and we may conceive it to be couched in the following terms:—"Whereas it is impossible to manufacture and sell pure gas at a less price than is now charged by the gas companies of London, and the inhabitants thereof being perfectly satisfied with the price and quality of the gas wherewith they are at present supplied, it is expedient that the advantages and privileges they now enjoy from the said conditions of gas supply should be continued to them for evermore."

An appendix to the report contains the treasurer's account, from which it appears that some credit is due to the managers for the manner they have husbanded their funds, as they have a balance in hand exceeding one half of the £855 contributed by the vestries and district boards. One item of expenditure, which of course meets our approval, is for JOURNALS OF GAS LIGHTING, the perusal of which we flatter ourselves, has materially aided in enlightening the delegates as to the true condition of the gas supply of the metropolis, and has thus produced greater moderation in their feelings and demands.

The Life Light of the Hon. W. E. Fitzmaurice, which has been flickering about in various directions for many months past—now illuminating the Emperor of the French, now issuing from the crevices of carpet bags, now travelling on horseback through the town of Leeds, and which was last week throwing its rays over the camp at Aldershot—has been at length concentrated in the form of a prospectus of "The Universal Light and Portable Gas Company (Limited.)" The inventors of this new illuminating power which is to supersede gas seem determined to keep their light under a bushel—or rather in carpet bags—for they have not yet given any intelligible explanation of what it consists. They show the effects, they allow the spectators to wonder and admire, they relate the advantages of the new source of illumination, and expatiate on its cheapness, but they afford no means of testing the accuracy of these statements. Nor is the prospectus of the company—that is to be—at all more explicit than the previous accounts. The light, we are told, is "in all respects superior to every other hitherto invented," and it can be used either as a "grand light," with intense power for sea or land, or as a "domestic light." These distinct lights are apparently produced by different means and by different kinds of gases. The domestic light can be "manufactured from oil or any fatty substance," whilst "the grand light is effected by means of two improved gases, united only at the instant of lighting, and further aided by the application of a medium at the moment of combustion." We infer from these accounts that the "grand light" is nothing more than the revival of the Drummond light, produced by the incandescence of lime exposed to the combustion of jets of hydrogen and oxygen gases; and that the "domestic light" is oil gas doctored with camphorated ether. There are, however, several properties attributed to the Life Light quite incompatible with either of those well-known sources of illumination. Alleged freedom from all injurious effects and explosions can scarcely refer to the combustion of a mixture of hydrogen and oxygen gases; nor can the "freedom from smoke and smell" refer to oil gas; whilst the assertion that the light is four times cheaper than common coal gas is certainly not applicable either to the oil gas or to the Drummond light. Another statement of the prospectus, to the effect that in the use of this gas for domestic purposes "no tubing is at all necessary," is equally unintelligible.

In no scheme ever put forward to attract speculators did we observe such endeavours to throw a veil of mystery over the *modus operandi* by which the wonderful effects and great profits are to be produced. So far as we are enabled to lift the veil, the marvellous invention of the Life Light appears to be merely the revival of exploded projects that have been proved to be impracticable. The prospectus states that numerous orders have been already received "from contractors, public institutions, mercantile shipping, mining, manufacturing, and engineering firms, as well as from private individuals and possessors of mansions and factories," who are anxious to be supplied with the Life Light on the terms and conditions specified. If the Universal Light and Portable Gas Company (Limited)—supposing it to be formed—fulfils but one half of the promises contained in the prospectus, there can be no doubt that the orders would rapidly increase; but in proportion to that increase would be the shortness of the interval before the affairs of the company would be wound up.

Shortly previous to the recent change of Ministers, the Lord President of the Council appointed a commission, consisting of Professors Faraday, Hofmann, and Tyndall, Mr. Redgrave, the Royal Academician, and Capt. Fowke, of the Royal Engineers, to examine and report on the effect produced upon the pictures by the combustion of gas in picture galleries. The inquiry should not be limited to galleries lighted by gas, but ought to extend generally to picture galleries, however lighted. The smoky atmosphere of towns no doubt does exert a prejudicial influence over these treasures of art; and as it may be difficult to draw the line between the damage caused by the different agents at work, the galleries of the country residences lighted by gas should be especially examined, such, for instance, as that at Petworth House, the whole of which has been for years so lighted.

The Court of Queen's Bench has given judgment in the last appeal of the Cambridge Gas Company, and has confirmed the decision of the Recorder with respect to the rateable value of their works. The case will be fresh in the memory of our readers, and there is, therefore, no necessity for our recapitulating its leading features. All the judges of that court agree that "profits must be an element in determining the rateable value;" and unless this case should be carried to the Court of Exchequer Chamber, as it may be under a local Act, there is no hope for relief to gas and water companies except by recourse to the Legislature. It is understood that the attention of a distinguished member of the bar, who has also a seat in Parliament, has been directed to the subject, and a bill will probably be introduced by him next session with the view of defining more clearly what the law is, and of enabling the superior courts to receive evidence as to value, instead of being confined to the consideration of the case as stated by the inferior court.

Register of New Patents.

2680.—FREDERICK LOOS, of Mercer Street, Long Acre, London, for "*Improvements in gas-regulators.*" Patent dated Nov. 25, 1858.

The object of this invention is to render gas-regulators more perfect and effective in operation, cheaper in construction, and more convenient in use. Gas-regulators, as is well known, are apparatuses now extensively used for controlling the flow of gas as it issues from the street mains or supply-pipe to the burner, so that a constant and unvarying stream of gas may be supplied to the burners, notwithstanding the difference of

pressure in the mains, and without reference to the number of burners. When the gas-regulator is constructed on scientific principles, and is not liable to get out of order easily, the invariable result of the use of this instrument is a considerable saving of gas, and freedom from annoyance caused by smoke from the excessive height of the flame from the burner, cracking of shades, and danger to any combustible materials within reach. But in practice it has been found that by using many of the so-called regulators with a low pressure of gas, it is difficult to procure a sufficient supply, for they act as impediments to the free passage of the gas, when in reality their office is only to control its excessive expenditure. In many cases they are so wrongly constructed and are so faulty in principle as to bring discredit on what is undoubtedly a most useful and economical invention.

These improvements have for their end the perfecting of the apparatus and the adapting of it for use in gaseliers for drawing-rooms, &c., for street lamps, and for general purposes in which gas-regulators are used. The invention consists, in the first part, of placing valves in any angular position, so as to maintain an equilibrium. Secondly, the invention consists of making the spindle hollow, so that it may serve as a lubricator. Thirdly, in making the larger-sized regulators in two or more separate parts, the annular groove for the reception of the mercury being attached to the chamber by screws or otherwise. Fourthly, in a lever-hinge joint for steadying the disc; and lastly, in making an outlet or outlets for the gas through a spindle or tube, or spindles and tubes attached to the floating or regulating-chamber, which chamber is immersed in the annular cup containing the mercury or other suitable fluid.

The drawings attached to the specification show various modes of carrying out the four first heads of the invention.

The patentee wishes it to be understood that he makes no claim to the use of mercury in gas-regulators in this patent, Mr. Hulett having first discovered this to be the most suitable fluid for the purpose so long ago as the year 1848, and described its use in his patent for that year. Neither does he claim the general construction of the regulator as described, for, with the exception of the parts hereinafter claimed, the same is not new. And in reference to the regulator shown and described in the first drawing, he remarks that it is not requisite that the equilibrium valves should be set at right angles, for any other angle would answer the same end. But what he claims is the constructing gas-regulators with equilibrium valves placed at an angle with each other, so as to equalize the pressure on them and prevent condensation from accumulations so as to impede the full passage of gas, and making the spindle or shaft hollow, so as to contain oil or other suitable matter for lubricating the points or centres on which it works.

2. He claims forming the annular ring separately, for the convenience of attaching it, and for the more economical manufacture of the gas-regulator. He also claims the hinge-joint attached to one side of the regulator, to give the floating drum or inverted vessel a horizontal motion; also the adjusting valves by the use of set screws.

3. He claims the use of an annular cup attached to the top of the floating inverted cap, to contain mercury or other suitable fluid, which cup forms a gas or air-tight joint by having the tube to which the burner is attached sufficiently long to dip in the fluid, which tube is also attached gas-tight to the cover, the cover being also gas-tight.

4. He claims constructing a valve attached to the lower end of the outlet-pipe, to keep the floating cap in a horizontal position.

5. He claims the tinning or otherwise coating the arm or lower part of the arm of the inverted floating vessel, so as to form an amalgam with the mercury, which causes the mercury to attach itself to the floating vessel.

2692.—WILLIAM RICHARDS, of the Gas-Works, Barcelona, Spain, engineer, but now of Harpur Street, Red Lion Square, London, for "*Improvements in the construction of gas-meters.*" Patent dated Nov. 26, 1858.

This invention relates to improvements in wet gas-meters, whereby a greater approximation to truth in the amount of gas passed through the meter will be attained than in the ordinary construction of meters, and a more equable action is ensured.

The first improvement consists in constructing the measuring-wheel or drum with chambers or compartments, having a diminished capacity near the axle. This end is attained by forming the wheel with sides inclining inwards towards the axle, instead of making the sides parallel to each other. Thus the great variation in the measuring capacity of the chambers at present experienced by the alteration of the water-line, will be reduced to an inconsiderable amount.

When using this construction of drum-wheel the part called the "hollow cover" can be made flat or concave (the conical space at the inlet side of the wheel allowing sufficient space for the insertion of the spout), and thus a broader drum than heretofore can be mounted in a given size of case.

In addition to contracting the measuring-chamber laterally near the axis of the drum, it is proposed also to place the cross partitions which divide the wheel of the drum into chambers at a much greater angle to the axis than heretofore, in order that the resistance to the water may be as uniform as possible; and the inlet and outlet passages of the measuring-chamber are so arranged that the bulk of the water entering by the inlet to displace the gas, shall be as nearly as possible equal to that of the gas replacing the water in the outlet.

It is further proposed to place a plomb-valve at the back of the meter (the opposite side to that at which the float is situated), which will serve to prevent surreptitious abstraction of gas by the meter being tilted forward.

In relation to the construction of the drum, it is remarked that, instead of the chambers having openings near its centre, they may be closed at that part, if thought desirable, by the partitions being secured to a cylinder mounted on the drum-axle. In this case, the capacity of the inlet and outlet passages of the drum would require to be somewhat increased, to allow of the free movement of the drum through the water.

The claims are—

1. For constructing the measuring-drum or wheels of water-meters as described, whereby the effects of the ordinary variations in the water-level in respect of the measurement of gas passing through the meter will be in great part neutralized, and a regular flow of gas through the meter, without pulsations, will be obtained.

2. The valve arrangement described for cutting off the supply of gas to the exit-pipe.

2765.—SAMUEL PETERS, of Rue de la Briche, at St. Denis, near Paris, mechanic, for "*Improvements in the manufacture of pipes and tubes, and in the apparatus employed therein.*" Provisional protection only obtained. Dated Dec. 3, 1858.

This invention consists in the manufacture of pipes and tubes in the following manner, and in the apparatus hereafter described.

The sheet metal from which the pipes and tubes are to be made is first heated in a suitable oven or furnace, and then placed between rollers, of which the lower is grooved with grooves of various sizes, and the upper has corresponding projections, so that the heated sheet or strip of metal is passed between the two in one or other groove, according to the size of the pipe or tube to be made. It may be pressed into the form of a **U**, and the bent sheet or strip then passes between other grooved rollers in the same machine, which impart to it a tubular form. The partially-formed pipe or tube is then again heated in an oven or furnace to a welding heat, and passed through a pair of grooved rollers, the grooves of one of which are larger than the corresponding grooves of the other, and the former roll is driven at a less velocity than the latter. During its passage through these welding rollers, the pipe or tube is supported by a double mandril.

PROVISIONAL PROTECTION

HAS BEEN GRANTED FOR THE UNDERMENTIONED INVENTIONS.

1244.—GEORGE JOHN PARFITT, of Bath, in the co. of Somerset, city surveyor, for "*Improvements in gas-burners.*" May 20, 1859.

1308.—JAMES CORN BENT, of Birmingham, gas-meter manufacturer, for "*Improvements in gas-meters.*" May 26, 1859.

1314.—LÉON FARRENE, gentleman, and BERNARD SUBRA, professor of mathematics, both of Paris, for "*Improvements in gas lighting by means of direct carburators.*" May 27, 1859.

1400.—ALFRED VINCENT NEWTON, of 66, Chancery Lane, London, for "*Improvements in gas-meters.*" A communication. June 8, 1859.

NOTICES HAVE BEEN GIVEN OF INTENTION TO PROCEED WITH THE UNDERMENTIONED INVENTIONS.

742.—GEORGE NEAL, gas chandelier and fitting manufacturer, of Great Charles Street, Birmingham, for "*Certain improvements in apparatus or fittings connected with the burning of gas for regulating and economizing its consumption.*" March 23, 1859.

886.—THOMAS SPENCER, of 192, Euston Road, Euston Square, London, analytical and consulting chemist, for "*Improvements in the economical treatment of refuse or waste matter containing sulphur.*" April 9, 1859.

Legal Intelligence.

COURT OF QUEEN'S BENCH.

WESTMINSTER, TUESDAY, JUNE 14.

(*Sittings in Banco, before Lord Chief Justice* CAMPBELL, *and Justices* WIGHTMAN, ERLE, *and* CROMPTON.)

DUX *v.* THE EQUITABLE GAS COMPANY.

The plaintiff in this case applied, under the 79th section of the Common Law Procedure Act of 1854, for an injunction against the defendants. The plaintiff is the occupant of a house in Jermyn Street, and since March, 1858, she has been supplied with gas by the company. The gas was supplied and paid for quarterly, and the plaintiff had paid for it regularly up to last Lady-day. The payment was made upon the 9th of April, but immediately afterwards a payment of £5 was demanded from her by the defendants as a security for the future supply of gas. The plaintiff remonstrated against such a demand, as being unusual; and, on her refusal to meet it, the gas was cut off. However, it was afterwards let on again, and she had enjoyed it up to a few days ago, when the demand for £5 was renewed, and, on her again refusing to answer it, the supply ceased. An action had been commenced against the company, and a writ had been served upon the secretary. The present application was for a writ of injunction against the repetition of the injury complained of pending the action.

Lord CAMPBELL: You may take a rule.

THE QUEEN (ON THE PROSECUTION OF THE CAMBRIDGE GASLIGHT COMPANY) *v.* THE GUARDIANS OF THE POOR OF THE CAMBRIDGE UNION.

The ATTORNEY-GENERAL, Mr. D. D. KEENE, and Mr. MILLS, with whom was Mr. O'MALLEY, Q.C., appeared for the plaintiffs; and Mr. BOVILL, Q.C., and Serjeant TOZER, with whom was Mr. LUSH and Mr. ORRIDGE, appeared for the respondents.

This was a special case, arising out of an appeal against a certain valuation of the rateable property held by or in the occupation of the Cambridge Gaslight Company, situated within the several parishes of the Cambridge Union, made under the provisions of "The Cambridge Award Act, 1856." The appeal was heard before the Recorder of the borough of Cambridge, at the General Quarter Sessions of the place, held on the 8th of January last, on which hearing the court ordered that the valuation should be amended by reducing the amount at which the gross value of the house and land, works and mains of the company in the parish of St. Andrew-the-Less was therein estimated, from the sum of £3276 to the sum of £1850, and that the valuation should be further amended by reducing the net value from £2542 to the sum of £1700, subject to the opinion of the Court of Queen's Bench upon the points reserved. Those points were, whether it was competent to the company to appeal to the borough sessions in January, the October session being the next after the completion of the valuation, and whether the principle of ascertaining the rateable value adopted by the guardians was the correct one. If the first question was answered by the Court of Queen's Bench in the negative, the order of session was to be quashed and the appeal dismissed; and if in the affirmative on the first, and the negative on the second, then the order of session was to be amended by substituting for the figures £1700 the figures £750.

The ATTORNEY-GENERAL, in opening the case, called the attention of the

court to the provisions of the Cambridge Award Act in reference to the powers given to the guardians to make a valuation of the whole or any part of the property situated within the union. Under the provisions of that Act, he said, the guardians, in July or August last, caused a valuation to be made of so much of the rateable property within the borough of Cambridge as consisted entirely of the gas-works and the whole property of the company only. They had also adopted that valuation as the basis of the contributions made on the different parishes. No notice, however, was given to the parties principally interested that that valuation was adopted until such contribution order was issued and the rate made, when they forthwith gave notice of appeal.

Mr. Justice ERLE inquired what points the learned counsel intended to argue?

The ATTORNEY-GENERAL said he had to contend that the appeal to the January session was in time, and that the principle adopted by the respondents of ascertaining the value of the rateable property of the appellants was wrong.

Mr. Justice ERLE said, in reference to the time for appeal, the court, he thought, were all of opinion that it was in time, unless that opinion should be altered by what was said on the other side. The rate was published on the 16th of October, and the session was held on the 18th, thus giving the company only twenty-four hours to make up their minds whether they would appeal. That, therefore, could not be the next practicable session.

Mr. BOVILL said the appeal was not against the rate, but against the valuation. By the Act of Parliament notice of that valuation had to be given, and the appellants had statutable notice sufficiently early to enable them to appeal to the October sessions.

The ATTORNEY-GENERAL said the valuation was made on the 31st of August. On the 4th of September it was advertised in the Cambridge newspapers as lying open for inspection, in accordance with the provisions of the Act; and on the 15th of September a circular letter was addressed by the guardians to the churchwardens and overseers of the different parishes in the union, intimating that the valuation had been adopted.

Mr. BOVILL said a notice was given to the appellants on the 1st of September.

Lord CAMPBELL: That the valuation had taken place, but not that it had been adopted. The circular letter of the 15th states that——

The ATTORNEY-GENERAL said, if necessary, he was prepared to contend that between the time when that notice was sent to the company and the time when the circular letter was sent to the overseers, it was competent to the guardians to reject that valuation, and that until the order of contribution was made on the 6th of October, there was no notice to the company of its adoption. He should further contend, that such being the case, there was no time to appeal to the then next quarter sessions, which were held on the 18th, because the Act of Parliament required that fourteen clear days, notice of appeal should be given. And, further, it appeared that the contribution order was not acted upon until the 14th of October, when the first parish rate upon the basis of that valuation was made, and that rate was not published until the 16th, just two days before the session was held. The following sessions were held in January, and due notice was given of the company's intention to appeal to them. The learned counsel read the several sections in the Act of Parliament referring to these points, which he submitted were conclusive in favour of the appellants' case.

Lord CAMPBELL: I suppose, Mr. Bovill, you will contend that the notice to the overseers would be notice to every individual in the parish.

Mr. BOVILL: No, my lord; my contention is, that the appeal must be against the valuation when made, and that no notice was required by the Act of Parliament except the notice in the newspapers.

Lord CAMPBELL: But there is no right of appeal until it is adopted by the guardians.

The ATTORNEY-GENERAL: And made the basis of a rate?

Lord CAMPBELL: When it is said to be adopted, it must be assumed to have been adopted for that purpose.

The ATTORNEY-GENERAL: The only difference is, that, being adopted *simpliciter*, it may; but the question is whether there may be a *locus pœnitentiæ*, if, between the time of adopting it and the making of a rate, it should be discovered to be altogether erroneous.

After a lengthened argument on these points,

Lord CAMPBELL said the notice to the company on the 1st of September could work nothing, because it was only a notice of the valuation having been made, and there was a contingency whether it would be adopted or not; and until adopted, no ratepayer could appeal.

The ATTORNEY-GENERAL said he did not know whether the court would consider it necessary for him to go into the second point now, but it seemed to him to lie within a very narrow compass; but perhaps their lordships could come to a satisfactory conclusion without having the case re-stated.

Lord CAMPBELL said the great question seemed to be whether the profits might be taken into consideration in arriving at the rateable value—whether that evidence was admissible.

The ATTORNEY-GENERAL said the case was very imperfectly stated, and it was very much to be lamented that the real facts were not put forward, so as to enable the court finally to decide the matter. But he thought that, if it was admitted that this sort of evidence might be taken into consideration, it would be perfectly illusory, and contrary to every decision pronounced by this court upon the question. It was stated in the case that the counsel for the respondents contended at sessions that the rateable value must be determined by ascertaining for what the hereditaments occupied by the company would let for to a tenant from year to year, such tenant paying all usual tenant's rates, taxes, and tithe commutations, rent charge, providing for repairs, renewals, and insurance, so as to restore the said hereditaments in the same state at the end of the year as they were at the beginning, and securing to himself a fair profit and a proper remuneration for the skill and labour that he employed; and, further, that it was competent for witnesses who were acquainted with the subject to take into account the actual receipts and disbursements of the company in forming their estimate of the sum for which the said hereditaments would let from year to year. Now, what in the world did "securing to himself a fair profit and a proper remuneration for the skill and labour employed" mean, as applicable to this case? He could imagine that in the valuation of a farm such words might find a place, but where the rating of a gas company was concerned, according to the principle laid down in so many cases in this court, it seemed to have no connexion. For what skill and for what labour was a gas company to secure remuneration, or to insist should be taken into consideration in this way? The only mode in which the value of the company's property could be arrived at was by ascertaining what a rival gas company would give for the whole of the works, machinery, offices, stations, and pipes.

Mr. Justice CROMPTON: What would any one wanting them for these purposes give for them?

The ATTORNEY-GENERAL: Exactly.

Mr. Justice ERLE: That has something to do with profits. Supposing one gas company worked at a loss of £1000 a year, and another one at a profit of £1000—the question is, what would induce any one to take the first, and what would he give for the other. Would it not be upon a calculation of a fair remuneration for skill, &c.?

The ATTORNEY-GENERAL: Supposing it were to happen that the property was of the same description and value.

Mr. Justice ERLE: Which often happens. According to station and locality, one is worked at a profit and another at a loss. A tenant for the property worked at a loss you could not find; a tenant for the property at a profit you could find; and after paying all these outgoings, you would rate him for the residue.

The ATTORNEY-GENERAL: No, my lord. Excuse me, I believe that is importing a consideration which does not belong to it.

Mr. Justice ERLE: What, according to the Parochial Assessment Act?

The ATTORNEY-GENERAL: Yes, my lord. The Parochial Assessment Act is in these words: "No rate for the relief of the poor in England and Wales shall be allowed by any justices, or be of any force, which shall not be made upon an estimate of the net annual value of the several hereditaments rated thereunto, that is to say, of the rent at which the same might reasonably be expected to let from year to year, free of all usual tenant's rates and taxes, &c., and deducting therefrom the probable average annual cost of the repairs, insurance, and other expenses, if any, necessary to maintain them in a state to command such rent." There is not one word here about profits.

Mr. Justice ERLE: You said that profits had nothing to do with the rent of a farm. Do you think that a tenant would not consider, in taking a farm, whether he could grow wheat or thistles upon it?

The ATTORNEY-GENERAL said that went with the nature of the premises themselves. Upon principle and reason and authority, he contended that the court were bound to exclude all consideration of what profits a tradesman or body of tradesmen might make.

Lord CAMPBELL: It is quite clear that profits are not to be the basis of the assessment. The question is, whether they may or may not be admitted as an element in the consideration.

The ATTORNEY-GENERAL submitted that they could not be regarded at all. If they were once admitted as an element, they would tend in most cases to mislead. The profits might be considered if the element of profit could affect the nature of the property rated. But when the profits depended upon a great variety of considerations, most of them wholly foreign to the property itself, and unconnected with that property, the principle was utterly unsound. In the case of *Fossett v. the Justices of Bombay*, the judgment of the Privy Council affirmed that an assessment upon profits was an assessment upon a wrong principle; and Vice-Chancellor Knight Bruce, in delivering the judgment of that court, said—"If of two manufacturers in the same street, carrying on precisely the same kind of business by means of fixed machinery, one makes an annual profit of £2000, and the other a profit of only £1000, that circumstance, if the respective buildings and machinery do not materially differ in size, description, or quality, cannot render the one liable to be assessed at a higher rate than the other. The greater or less degree of success with which a trade or manufacture is conducted in a warehouse, manufactory, or other building, having or not fixed machinery, depends upon many and various contingencies, and cannot form a just ingredient in any calculation of its true annual value."

Lord CAMPBELL said that all went to show that profits must be looked at.

The ATTORNEY-GENERAL still maintained that the principle was fallacious. Take the case of the present appellants—their receipts were taken at £10,000, but who could tell whether the whole of that sum, or any part of it, down to £10, was or was not applicable to personal skill, diligence, courtesy, habits of business, or anything else, which had nothing at all to do with the value of the property, if let to a new gas company, coming into the town of Cambridge for the first time? He submitted, therefore, that this was evidence which ought to be altogether excluded, and that the only evidence which could properly be relied upon was such as related to the expense actually incurred in respect to the property—the outlay actually made—the pecuniary cost of establishing the gas-works.

Mr. KEENE followed on the same side. In reference to the first point reserved, he urged that the company were not bound to give notice of appeal until the publication of the rate. Supposing the case to have been not that the company were appealing because they were over-rated, but some one else appealing because the company were rated too low, how would the case stand then? Why, that they could have no notice of the amount at which they were assessed until the publication of the rate, and consequently would be deprived of their right to appeal. The last day for giving notice of appeal was on the 4th of October, and the publication of the rate was not made until the 6th. It was, therefore, not very uncharitable to suppose that it was done for the purpose of raising this very question, and that there was some motive in view in thus denying them reasonable time to consider what course they would take. In reference to the second point, he said that when he read the case as stated by the Recorder, he had great difficulty in saying that it gave a proper account of what was done at the sessions. But if he was bound by it, he was not there to contend that the actual receipts and disbursements might not form some element in the consideration of value.

Mr. Justice CROMPTON: It is very difficult to say that when one man is asked what he will give for premises he should not calculate what another man has done upon those premises. They seem to have excluded that from their judgment, for they say it is only an element in estimating what the premises would let for from year to year.

Mr. KEENE said the question raised at the sessions was whether gas-works should be rated in the same way as railways, and whether the guardians were to start by taking all the appellants' gross receipts, and rating them as artificial land.

Lord CAMPBELL: You stand upon the principle that profits are to be entirely disregarded?

Mr. Justice ERLE: Surely "outlay" would never do. In the case of the last company we had before us, there was an outlay of £350,000 upon water-works, which had become obsolete and no use. It would have been a most unjust thing to rate them at 7½ per cent. upon the capital thus expended.

Mr. KEENE: Yes, because there was nothing to show for it.

Mr. Justice ERLE: Yes, there were the works.

Mr. KEENE said they were not here to contend for the view taken at the sessions, because they were prepared to admit that they were rather wrong, though he believed on the other side they were infinitely worse.

Lord CAMPBELL: What do you press?

Mr. KEENE said at the sessions two estimates were produced, setting forth different modes of arriving at the rateable value. Those estimates were placed before the Recorder, and his point was that the one adopted by him was erroneous, and could not be maintained.

Mr. Justice ERLE: I observe that the Recorder has adopted a mode of estimating contrary to that for which you contended; but in the application of that mode he has taken away one half of what the other side rated you at.

Serjeant TOZER said he was present at the session, and he thought the case was very correctly and fairly stated.

Mr. Justice WIGHTMAN said he thought the profits must be an element in the consideration, and the Recorder did not seem to have gone beyond that.

Lord CAMPBELL said he thought some specific objection should be pointed out to the mode adopted by the Recorder.

Mr. KEENE said he objected to what was said about "fair profit, and a proper remuneration for the skill and labour employed."

Lord CAMPBELL said that was so much in favour of the appellants as a deduction.

Mr. Justice CROMPTON said, whatever the Recorder had done, he seemed to have stated a principle that it was very hard to quarrel with.

Mr. MILLER, for the appellants, said he relied upon the principle laid down in the case of the Birmingham Gaslight Company—viz., that the court could not take profits into consideration.

Lord CAMPBELL: Not as a basis of rating. Upon what principle do you say that you ought to be rated?

Mr. MILLER said, upon an estimate of the rent which a tenant from year to year would give for the premises, and, to arrive at that, he would take into account first of all the capital expended.

Mr. O'MALLEY, who also appeared for the appellants, said all that he should say was that the case presented to the court did not state the question raised between the parties. The principle for which he contended at the sessions was never mentioned except to repudiate it. He never saw a more unfair representation of what took place at sessions than that was.

After some further remarks,

Mr. Justice ERLE said the principle of rating as stated was unobjectionable.

Mr. BOVILL then proceeded to argue the second point—that the appellants were out of time for not appealing to the October sessions.

Serjeant TOZER followed on the same side, after which—

The COURT delivered judgment in favour of the company, on the ground that until the rate was made and published under the order of contribution there was no grievance which the company could appeal against, and that therefore the appeal to the January sessions was in time.

WEDNESDAY, JUNE 15.

THE QUEEN *v.* SIR SAMUEL MORTON PETO, BART., AND OTHERS.

This was a case stated by the Essex Quarter Sessions for the opinion of the court with respect to the principle on which the basins of the Victoria Docks were to be assessed to a lighting and watching rate. The docks in question were situate at West Ham, and consisted of a tidal basin and an inner dock, on the sides of which extensive warehouses had been erected. The whole of the docks covered 165 acres of land, of which the two basins occupied 95 acres. The basins were constructed in what was formerly marsh land, and had been excavated so as to be below low water mark, and being used as docks, had been turned into a source of commercial profit. The question was, whether these basins were to be rated at a lower rate, as "land," or at a higher rate, as houses, buildings, "and property other than land." The question depended on the construction to be put by the court on the 33rd section of the Lighting and Watching Act (the 3rd and 4th William IV., cap. 90), which "provided that owners and occupiers of houses, buildings, and property other than land, rateable to the relief of the poor, in any such parish, shall be rated and pay a rate in the pound three times greater than that at which the owners and occupiers of land shall be rated."

The question was argued on the 1st inst. by Mr. TINDAL ATKINSON and Mr. MURRAY on the part of the parish, who contended that the basins should be rated at the higher rate as "property other than land;" and by Mr. BOVILL, Q.C. (with whom was Mr. WHITE), on the part of the appellants, who contended that they should be rated at the lower rate as "land," the basins in question being, in fact, land covered with water.

The COURT having taken time to consider,

Mr. Justice ERLE now gave his judgment in favour of the appellants, that the basins should be rated as land.

Lord CAMPBELL gave his judgment (in which Mr. Justice Wightman and Mr. Justice Crompton concurred) in favour of the respondents, that the basins should be considered as "property other than land," and so rated on the higher scale.

Judgment for the respondents.

COURT OF EXCHEQUER.

WESTMINSTER, THURSDAY, JUNE 9.

(*Sittings in Banco, before the* LORD CHIEF BARON *and Barons* BRAMWELL, MARTIN, *and* WATSON.)

HILLS *v.* THE LONDON GAS COMPANY.

The plaintiff in this case claims to be the inventor of the process of purifying gas from sulphuretted hydrogen by means of hydrated oxide of iron, and of the method of renovating the said oxide by exposure to the air, for which invention he took out letters patent in the year 1849.

The action was brought for an infringement of such patent, and the case was tried at the last summer assizes at Guildford, resulting in a verdict for the plaintiff. A rule *nisi* to enter the verdict for the defendant, or for a non-suit, was obtained by Mr. Bovill in November last, on the following grounds:—

1. That the plaintiff's invention was not new by reason of Croll's and Laming's patents, and the disclosures made by their respective specifications.

2. That the plaintiff was not the inventor, on similar grounds.

3. That the plaintiff's specification was insufficient and bad for not specifying which hydrated oxides of iron would answer the purpose, or for claiming all hydrated oxides of iron, though some would not purify gas.

4. That the mere application of hydrated oxide of iron to absorb sulphuretted hydrogen from gas was not the subject of a patent, its properties and effects with reference to sulphuretted hydrogen being previously well known.

5. That the renovation of hydrated oxide of iron by exposure to the air being previously well known, its application to purifying gas was not the subject of a patent.

6. That the verdict was against the evidence on the several points submitted to the jury.

Cause was this day shown against the rule.

The ATTORNEY-GENERAL, Mr. MONTAGUE CHAMBERS, Q.C., Mr. GROVE, Q.C., Mr. HINDMARCH, and Mr. POLLOCK appeared for the plaintiff; and Mr. BOVILL, Q.C., Mr. LUSH, Q.C., Mr. WEBSTER, and the Hon. GEORGE DENMAN appeared for the defendants.

Baron BRAMWELL said it occurred to him that the best way to make the case intelligible to the court would be to state the questions which were raised at the trial, and then to read over as much of the evidence as bore upon them.

Mr. DENMAN, who was the only counsel for the defendants present at the moment, said his learned friends on that side had consulted on the subject, and they had come to the conclusion that it was desirable his lordship should read the whole of his notes.

Baron BRAMWELL said he was quite of a different opinion—they would be absolutely unintelligible, as it took four or five days to try the case.

The LORD CHIEF BARON said there were some things the reading of which tended very little to edification. For instance, an account, or a catalogue, or a lease.

Baron BRAMWELL said he had thought it over and come to the deliberate conclusion that the court could not understand the case until the questions were first stated. It might be that some parts of the notes would require reading.

Mr. DENMAN said he should not object to the course suggested by his lordship, that the case should be first stated and then the notes read, but in the absence of his learned friends he did not like to assent to dispense with the latter.

The LORD CHIEF BARON said in a cause the trial of which occupied only an hour or two, where the witnesses were few and the facts short, it might be very well to learn the facts by having the evidence read, but as to listening to a trial which lasted four or five days, he thought it was about the worst method imaginable for getting at the facts of the case. He observed too that there was before the court a printed report of the evidence, which he took to be the production of both parties, and therefore *cui bono?*

After some further conversation,

Baron BRAMWELL proceeded to state the facts of the case. He said, the action was for the infringement of a patent, and there were the customary pleas—pleading not guilty, denying that the invention was new, and so forth. On the trial it was admitted that the defendants had done that which was an infringement of the plaintiff's patent, supposing it was a valid patent. The plaintiff's patent, I believe I am correct in stating, concisely was this—it was a patent for an improvement in the manufacture of gas. Something may turn upon the particular title of the patent, but that was its general purport. It appeared that gas as first produced from coal contains sulphuretted hydrogen, which it is necessary should be got rid of; and in order to do that, the plaintiff passes it through hydrated oxide of iron, the effect of which is that the hydrogen mixes with the oxygen and gets converted into water and leaves the sulphur, which remains in mechanical mixture with the hydrated oxide of iron. To purify gas by this process, however, would not be a profitable mode of proceeding unless they could renovate the hydrated oxide of iron, because the oxide being an expensive thing, if it became worn out by some thirteen or fourteen repetitions of the process of purifying gas—which it would do by taking such quantities of sulphur out of it—it would be impossible practically to adopt it. But it was found out that, by exposure to the air, the sulphur might be detached from it, and the material might be used over and over again. I believe that was the substance of the plaintiff's patent. Well, one question was whether he was the inventor of this—whether it was not invented by another person, whose name I do not remember—and whether he (the plaintiff) had not cribbed it in the course of seeing that man experimenting; and whether that other man was not the inventor of this very process. That was a question for the jury, and the jury determined that question in favour of the plaintiff. Another question was, supposing him to be the inventor, was the invention new? And one ground why it was alleged to be not new was that there was a prior invention by Croll—at all events, for a part of this process—and a patent by Croll in 1840. Croll's patent was this:—He stated in substance that he used the black oxide of manganese to remove from gas the sulphuretted hydrogen. He described passing the gas through it, and stated that the material through which it passed was put into an oven to expel the sulphur which it contained after the gas had been passed through it. After it had become red in the oven, he found that it was fit to be employed over again; so that his process was not to renovate the material by exposure to the air, but to oxidize by bringing it to a red heat in an oven. Then he goes on in this way:—"The same effect may be produced by the application of the oxide of zinc and the oxides of iron, and treated precisely in the same way, as above described." Upon which the defendant said—"Now that describes the use and application of hydrated oxide of iron. Oxides of iron mean all the oxides, hydrated and anhydrous as well; and therefore Croll has published here the use of hydrated oxide of iron for the purpose of purifying gas from sulphuretted hydrogen." The plaintiff answered to that—"It is not so, because Croll's patent points to the use not of hydrated but of anhydrous oxide of iron; and the reason why I say this is, that if you expose hydrated oxide of iron to a fire until it attains a red heat, as he describes, it becomes anhydrous; and as Croll says the thing should be used over again in the same state, it is evident he means the use of the anhydrous, and not the hydrated oxide." To which the defendant answered—"That is not so, because at the time that Croll's patent was perfected it was a common belief that, though hydrated oxide would purify, the anhydrous would not." That was the contention upon this point. Then I should say that Croll himself was called, and he very candidly admitted that he did not know at the time specified whether he was using hydrated or anhydrous oxide, and he had no notion that he was using one to the exclusion of the other at all. Then there was a grand controversy whether this oxide of manganese, the oxide of commerce, was hydrated or anhydrous; some said it was, and some said it was not; some said it was both, and I believe also they differed in the proportion in which it possibly might exist. But the defendants' contention, after all, was this, that in Croll's description he stated that he used the black oxide of manganese, and he only adds, in a general way, that the same effect may be produced by the application of the oxide of zinc and the oxides of iron; and they said the oxides of iron mean all the oxides, both hydrated and anhydrous, there being nothing in the specification to limit it to the use of the anhydrous only. Although Croll might not know the difference between the two, he has in terms comprehended both; and therefore, previous to the plaintiff's patent, he had specified the use of hydrated oxide. That was the first question in the case. Did I leave any question to the jury upon Croll's patent?

Mr. DENMAN: Yes, my lord.

Mr. POLLOCK: The question your lordship left to the jury was, whether by his specification or by his practice Croll had indicated the use of hydrated oxide of iron?

Baron BRAMWELL: I should say that Croll described that after his specification he practised the thing he had patented; but I think he said he discovered that a much less heat was necessary for the renovation of his material than he had supposed, and I think I left it to the jury to say whether, looking at the patent and specification separately, or looking at Croll's practice separately, or looking at them conjointly, there had been such a

publication of the process as would prevent the plaintiff's patent from being valid either in whole or in part. The jury found that it was not so, and that, so far as the question of fact went, Croll had not anticipated the plaintiff. What ground they proceeded upon I do not know, but they found everything in favour of the plaintiff—I do not say at present improperly so, but they did find for the plaintiff. But one question is, whether it was a correct finding, and another question was whether, upon the undoubted materials and as a matter of construction, this specification of Croll's does not include the use of hydrated as well as anhydrous oxide of iron.

Baron MARTIN: That depends upon the expression.

Mr. BOVILL: His lordship left it to the jury in this way:—"Now, gentlemen, it is for you to say whether his specification discloses the use of hydrated oxide of iron. If it means oxides in general, it does. Does his specification point out the use of hydrated oxide alone, or hydrated and anhydrous, or does it point out the use of anhydrous only? Was his practice beyond an experiment in the sense which I have described to you?"

Baron BRAMWELL: The next question was, whether the plaintiff's patent had been anticipated in whole or in part by a patent of Laming's? Now, in order to understand that, it becomes necessary to state a little further what plaintiff's specification was. He states that his material—I am not quite sure that I have this so completely in my mind as I have the other, but I think he stated that his material, the hydrated oxide of iron, might be prepared in a variety of ways.

The LORD CHIEF BARON (addressing the Attorney-General, who had just come into court) said, the question had arisen whether his learned brother Bramwell should occupy four hours in reading over the notes of evidence taken at the trial, and he must say that neither now or at any prior time could he give that sort of attention necessary to understand a continuous reading of evidence for that length of time. One could listen to a narrative of facts coming in successive order, but to listen to the details of the working out of specifications was, he felt, quite useless, and would convey no information to any one.

Baron MARTIN thought they might as well listen to a language which they did not understand.

The LORD CHIEF BARON said he should think Hebrew was much more intelligible than the language of specifications. He quoted extracts from one of those before him, and declared that even in reading it he did not understand it.

Baron BRAMWELL proceeded: The question as to Croll's patent was specifically this—Did he show the use of hydrated oxide of iron? In terms he did not, but his specification spoke of oxides. Then the question under Laming's patent was this:—The plaintiff specifies for the use of hydrated oxide of iron, and he describes the mode in which it may be prepared:—"Hydrated or precipitated oxides of iron may be conveniently prepared by decomposing sulphate or muriate of iron with hydro-sulphuret of ammonia, or with lime, magnesia, potash, or soda;" and he goes on to say—"They may then be absorbed into or mixed with sawdust, peat, charcoal, or breeze, or any such material, and afterwards exposed to the air." Well, now, Laming—I am not quite sure that I can state this as clearly as I could the other—Laming has this in his specification: "Chloride of calcium is both abundant and cheap, but under certain circumstances it may be desirable to make it for the purposes of gas purification by decomposing muriate of iron by means of lime or of chalk, when the latter will suffice." What is chloride of calcium—muriate of lime?

Mr. DENMAN: Yes, my lord.

Baron BRAMWELL: "In such case the oxides or carbonates which result are useful for the said purification, and need not be removed." Now, I believe that the effect of this is that chloride of calcium is an agent for the purification of gas?

Mr. GROVE: From ammonia.

Baron BRAMWELL: And Laming states that in the way in which he prepares it there is an oxide of iron produced which need not be removed, but which will be beneficial. In point of fact, the oxide of iron is the operative agent in the mixture; and, though he states that it was the chloride of calcium that did it, it was the oxide.

Mr. BOVILL: It is this, my lord: There are two matters to be got rid of—the ammonia and the sulphuretted hydrogen—and the chloride of calcium operates in both ways.

Baron BRAMWELL: That is to say, the chloride of calcium takes away the ammonia, and the hydrated oxide of iron the sulphuretted hydrogen; and Laming says—"This oxide of iron which I produce in preparing my calcium I find to be useful. In order to get rid of that difficulty the plaintiff says he makes his oxide of iron of muriate of iron, whereas I make my oxide of a sulphate of iron." Upon which it was said, "Those are identical;" and then there was a grand controversy whether they were—one party saying that an oxide of iron made with a muriate would be delequescent, and could not be used over again, whereas an oxide of iron made from a sulphate was not delequescent, and could be used as plaintiff used it. That question went to the jury, and they found it, like the others, in favour of the plaintiff. Then there is a kind of bye-question in the matter—whether the plaintiff has not got in his invention the identical thing which Laming has in his, only under another name. What is said to be ammoniacal liquor is put in two different ways. Laming says—"Another part of my invention consists in the use of the carbonates of manganese, iron, zinc, and lead, for the purification of coal gas, for which purpose I damp them, and dispose them, mixed or unmixed with sawdust or other matters, in the course of the gas, as is practised with the hydrate of lime; or I mix them with the purifying matters which I have claimed as my invention, or with other purifying matters hitherto in use for a similar purpose, in a state of mechanical division. To obtain these carbonates in an economical manner, I throw down from ammoniacal or gas liquor obtained in making coal gas, and previously distilled or not, the sulphur which it contains, and, having drawn off the clear liquid, I next precipitate its carbonic acid; or, instead of making two separate precipitates, I throw down a mixed sulphuret and carbonate of the precipitant or precipitants. I prefer to precipitate by means of a muriate or sulphate of manganese, iron, zinc, or lead. I do not claim either of these ways of obtaining a metallic carbonate, but I claim the use of the carbonates above named, however obtained, for the purification of coal gas." Now, I believe the two questions—the question upon the originality of these two patents, and whether the plaintiff was the inventor—were the questions really in the case. Now, if it is desired, I will read the notes.

The ATTORNEY-GENERAL said he was very desirous of sparing the time of the court, but, practically, there might be some difficulty attending the course which their lordships had suggested. There would be none if the rule were confined to the first four or five points, which raised the question of law; but he understood that the rule had been granted upon the ground that the verdict was against the weight of evidence. The difficulty applicable to this peculiar case was this, that there were at least six or seven or eight separate and distinct questions of fact left for the jury upon any one of which, if their opinion had been against the plaintiff, it would have been fatal to his right to recover. He (the Attorney-General) had gone carefully through the short-hand notes of his learned friend's motion to the court, upon some of those points which he seemed to have adverted to, and he collected, if he were not mistaken, that the court were not disposed to grant a rule, and he was desirous to avoid the inconvenience (to use no stronger term) of interrupting the arguments on the other side, as he should be obliged to do, because he would have no right of reply upon them, if statements were made to which he could not accede. To take an isolated point, which would, perhaps, make it intelligible to the learned baron who tried the case—Suppose, when the plaintiff's lips were closed, his learned friends on the other side should contend that the verdict was against the weight of evidence on the point of what took place before the Attorney-General when the deposit paper was made out and delivered, which was given in evidence, and upon which a very important—in fact, a decisive—question of fact arose. In such case, if the notes had not been read, their lordships might form an unfavourable impression of the plaintiff's case.

Baron MARTIN said it struck him that as there were two questions depending upon the construction of the three specifications, it would be a good plan to take them first. Those questions depended upon the construction of written documents.

The ATTORNEY-GENERAL assented to the suggestion.

Mr. BOVILL said he thought it would be a very good plan, and he thought the case might be disposed of upon it.

Baron BRAMWELL suggested that they should be taken separately and discussed separately.

Baron MARTIN said in the first place he wanted to understand what the plaintiff's patent was, and then what was the nature of the other two by which it was said it was anticipated.

The ATTORNEY-GENERAL said his first attempt should be to communicate that information. The only difficulty attending that course was that it might be impossible to deal specifically with the several questions that arose upon those written documents, without some reference to the evidence to make them intelligible.

Baron BRAMWELL: I think I see your difficulty. You know I had five days' teaching in this matter.

The ATTORNEY-GENERAL: Yes, and a very apt scholar your lordship became at last.

Baron BRAMWELL proposed that Croll's patent should be taken first, and a separate issue raised upon that, and wherever it was necessary he would read his notes.

Mr. BOVILL said, as far as he could judge, it would be convenient to take Croll's first, because the specification was very simple, and the explanations required to make the terms of art intelligible were extremely short—just one witness's evidence. It was a separate case by itself.

The ATTORNEY-GENERAL submitted whether it would not be more convenient to take the first and second points upon which the rule had been obtained, because they involved the entire question of invalidity, and therefore the whole merits of the case, instead of dividing the rule into two parts and taking Croll's alone.

Baron BRAMWELL: I believe it would be the shorter course to take each separately. I declare that, from what I remember of it, the complication of the second patent is such that it would be a mercy to everybody to be freed from the complications arising out of Croll's, when we come to consider it.

The ATTORNEY-GENERAL said he had called the attention of the court to the form of the rule, which, as respected the whole case, impeached the validity of the plaintiff's patent on the single ground of want of novelty, which want of novelty was said to be apparent, and proved, first, by the patent and specification of Croll of the date of 1840, and, secondly, by the patent of Laming of 1847. In order that their lordships might be able to institute a comparison between the legal effect of the one and the other, it seemed to be necessary at the outset that he should endeavour to possess them with a clear and distinct idea and impression of the whole contents, meaning, and legal effect of the plaintiff's patent. It would be superfluous and unnecessary for him to introduce his argument by adverting to the many authorities on the points involved in this discussion, still less would he be justified in detaining them with any contention in support of general principles. He would merely make these two observations: in the first place, that both upon the law and upon the fact, it must be remembered that the whole effect of the great body of evidence in this case, and particularly as affirmed and established by the verdict of the jury, was that Croll's patent had been in force (he could not say in operation, for that he denied), and before the public for the space of nine years before the plaintiff's patent was taken out. Laming's patent having likewise been in force for the two years previously, and both patents relating as they did to a subject of vast interest, to a manufacture of immense magnitude, and extent, and importance in the country, and more particularly in the metropolis, where so many gas companies existed, and where all these patents, if of avail—if really useful and beneficial to the public—one would have supposed they must have come into operation. But as the result of the whole evidence, the broad fact now stood before their lordships that this mode of purifying gas, so important to health and even to life, to say nothing of commercial considerations, never was, except by way of experiment, or upon some such limited scale as to amount only to experiment, brought into actual and practical operation. On the other hand, the plaintiff's patent had succeeded, and had been carried into effect and adopted to an immense extent by himself and by most—he thought he might say, all the gas companies in the metropolis and in every part of the country. The other observation he had to make here was this—that it was a well-established principle of law in the construction of patents, that if it be possible reasonably and fairly to consider and so to read a patent specification as to maintain and support the patent, that was the principle which the courts would adopt. He would now call their lordships' attention to the nature of the plaintiff's invention, premising that before he made the discovery which was the subject of this action, the mode of purifying coal gas from sulphuretted hydrogen, whether before or after having been wholly or partially purified from ammonia, was, by passing it through a mixture of lime, sometimes in a wet or moist state, and sometimes dry. The lime so used was, for a time at least, deposited upon the premises; if wet, it assumed a form very well known to persons unfortunately engaged in the manufacture of gas, as blue billy—a very deleterious and noxious substance; and if dry, having to be carted away, and was a moving nuisance wherever it went, and there was the greatest possible difficulty in disposing of it. This led to endeavours being made to find out some means by which coal gas could be purified from sulphuretted hydrogen by a process less inconvenient and less noxious, and Mr. Hills claimed that he had discovered a substance and a process—twofold in its nature, and involving two distinct and most valu-

able inventions—which he had made the subject of the patent in question. The first was, that he had made a preparation of hydrated oxide of iron, which, mixed with sawdust or anything else that would make it porous and adapted to the passage of gas through it, purified the gas from its sulphuretted hydrogen, and allowed it to pass out perfectly free and pure of this noxious ingredient. The court would observe that the essence of the invention was the discovery of the hydrated oxide of iron as the one substance. It might be mixed with sawdust; it might be more or less moistened; but these were matters ancillary to the process itself; and it might be used either alone or mixed with sulphate of lime.

Some discussion took place in reference to the title of the plaintiff's patent, and the nature and extent of his disclaimer. In reply to some inquiries by the Lord Chief Baron,

Mr. Bovill said the disclaimer was executed in 1850, but the plaintiff made no use of it. The plaintiff executed a further disclaimer in 1853, to which he obtained the sanction of the Attorney-General, but he did not file it until 1856.

The Attorney-General said he believed that in the interim proceedings were going on, the account of which occupied much time at the trial. There was an opposition, and then there was an arrangement between him and Laming, under which Hills was to take hydrated oxides, and Laming the anhydrous, and each was to pay a royalty to the other for the use of that which was not claimed by him. That arrangement was acted upon for some time and to a considerable extent, and these proceedings, sometimes hostile and sometimes amicable, occupied the interval referred to.

The Lord Chief Baron: In substance the disclaimer, whatever it may have upon the face of it, is of no earthly importance until June, 1856.

The Attorney-General said it was not, but that circumstance did not affect the question they were now considering. He was stating to the court that the substance claimed by Hills as his invention was the hydrated oxide of iron, and that all the other matters mentioned in the specification—the sawdust, sulphate of lime, or muriate of magnesia—were but ancillary and permissive, for the purpose of better adapting the material, by making it porous, to pass the gas through and purify it. The second part of his invention was equally important and valuable, and it was this: When gas was purified by lime, and had passed off purged of its sulphuretted hydrogen, the substance employed for the purification became useless—it was *functus officio;* it had done its work, and was hereafter applied to other purposes, or thrown away, and a new quantity of purifying material had to be obtained. Now, upon this invention of Mr. Hills, if no means could be discovered of continuing and repeating the use of the hydrated oxide of iron, the price of it was such that the process would be very expensive. As a purifier of gas it would have been an important discovery, but by no means so valuable in a commercial point of view as it had become by the discovery that, having purified gas in its passage through, it became, by no expensive operation, but by simple exposure to the air, completely renovated and fit again to be employed for a similar purpose for twenty or even twenty-five times. He would not dwell upon the fact, as he was not now addressing a jury, but it was perfectly clear that as there was nothing deleterious or uncomfortable to those engaged in these operations—nothing affecting health, still less affecting life—and as this system of purification could be effected at as small, if not a smaller expense than the system hitherto adopted, as soon as it became known and brought into actual operation, it was found to be a great practical improvement, and had been universally adopted throughout the metropolis. Such was the nature of the invention, and they had now to see in what way, by what means, under what circumstances, and with what qualifications—if there were qualifications—and with what variations in the process, whether required or permissive only, the specification pointed out how this discovery was to be carried into effect. [The learned counsel went through the plaintiff's specification in detail, pointing out the parts subsequently disclaimed by him, and insisting from various passages which he read that the plaintiff indicated clearly the use of hydrated or precipitated oxides, and which therefore were such as were the result of a process of manufacture, and not the natural hydrated oxides.] The plaintiff also, he said, proceeded to show how the hydrated oxide of iron *might* be, not how it *must* be prepared, and pointed out the method adopted by him for reoxidizing the material when it became charged with sulphuretted hydrogen after being employed in the purification of gas. They then came to the claim which plaintiff made, and concerning which he said—"I claim the precipitated or hydrated oxides of iron, or the sub-sulphates or oxychlorides of iron, from whatever source obtained, either by themselves, or, which is much better, made into a more porous material by being absorbed into or mixed with sawdust or breeze, or peat charcoal in coarse powder, or other porous or absorbent material, so as to be readily permeable by the gas, and either used alone or mixed with sulphate of lime, or sulphate or muriate of magnesia, potash, or soda, or in conjunction with any other purifying material at present in use for a similar purpose." A great deal hereafter might turn upon these words. A great point was made on the part of the defendants, that some of the materials here mentioned (and they laid their finger at one time upon one and then upon another—at one time sulphate of lime, at another muriate of magnesia), if mixed as the plaintiff said might be done, would make it, in effect, much the same in substance as that patented by Laming, because, though he did not give that exact substance as his material, he described one which their lordships would by-and-bye hear much about—the chloride of calcium, which was much the same in an operation of this kind, muriate of magnesia or sulphate of lime being a mere equivalent for chloride of calcium. The substance of the plaintiff's statement, however, was this: when you have obtained the hydrated oxide by any of the means pointed out, or by any other means, you may mix it—*i. e.*, it is much better, but not imperative, that you should do so—with sawdust, or any other porous material; and you may then use it at once—it is complete—or you may mix it with sulphate of lime or muriate of magnesia, &c., and then apply it to the process of purification. You have then nothing to do but to carry it out and expose it to the influence of the atmospheric air, when it becomes renovated, and ready again to be employed in the same process. The plaintiff then went on to say, "I do not claim peroxide of iron or manganese made at a red heat." This was extremely important, because there was a great body of evidence at the trial, on the one side and the other, which went to show, as insisted upon by the plaintiff, that if the hydrated oxide of iron was exposed to a red heat or to any excessive degree of heat, it would make it anhydrous, so that it was no longer the same substance, and, as the plaintiff said, would no longer perform the same operation. Whether it would or not was material for the legal question, but he merely pointed it out now to show that the plaintiff did not claim, as connected with his patent, the peroxide of iron or manganese made at a red heat. In fact, he said he had nothing to do with heating this substance for any purpose whatever; and he might have gone on to say, "My belief is, that you thereby render it anhydrous, and no longer applicable to the purpose." He then went on to say that he did not claim "the oxide of iron mixed with chloride of calcium," thus expressly disclaiming (and this part of the sentence was of the last importance to the case)—in terms disclaiming the use of the material which Laming had patented; and he added, "or with the muriates or sulphates of manganese, iron, or zinc, and absorbed into sawdust." The second part of the plaintiff's claim was "for repeatedly renovating or reoxidizing the said purifying materials by the action of the air, whenever they from time to time cease to absorb sulphuretted hydrogen, so that they may be used over and over again to purify the gas."

Baron Martin: Is there any difference between oxide of iron and hydrated or precipitated oxide of iron?—are they the same or different things?

The Attorney-General said "oxide of iron" was a generic term, and there might be eight or ten substances in art or nature which would not be inappropriately included under it. It included protoxide, that was, of the first impression, or containing the smallest quantity of oxygen as well as peroxide, and what was called a sesqui-oxide. It might also include hydrated oxide of iron—that was iron combined with water, or anhydrous—that which contained no water.

Baron Bramwell: You may say that it is divided into hydrated and anhydrous, and each of those sorts may be of three different degrees—the protoxide, the peroxide, and sesqui-oxide—making six varieties.

The Attorney-General said: Oxide of iron standing by itself would probably not be taken to mean hydrated oxide, and a great deal would turn upon what it might and what it did mean under particular circumstances and in conjunction with the context. What the plaintiff insisted upon, and what if it became material must be taken to have been found by the jury, and what he believed to be the philosophical truth, was that whereas the hydrated oxide of iron would immediately and effectually purify coal gas of sulphuretted hydrogen, the simple anhydrous oxide would produce no such effect. That statement of course involved a question of fact, which it might be necessary hereafter to refer to. He would not complicate the argument at the present time by further alluding to it, but would simply ask their lordships to bear in mind that it was not the anhydrous, but the hydrated oxide of iron which the plaintiff claimed to have discovered and applied to the purification of coal gas.

The Lord Chief Baron: Point out in what manner the specification, or the explanation of it, gives us any information what the one or the other is.

The Attorney-General: This is the first occasion on which the difficulty arises.

Baron Bramwell: I think you may really answer the question in this way: Hills, in this specification of his, says nothing about anhydrous, but he claims the hydrated. Well, then, when we are made sufficient chemists to know the difference, we shall conclude by implication that he does not mean the other.

The Attorney-General said he would endeavour, where there was a question partly of law and partly of fact, to state what that question was, so that their lordships might determine whether without reading the evidence they could take judicial notice of the meaning of any particular term to be found in any one of the specifications, or whether they would be obliged to resort to the evidence to assist them.

Baron Martin: We have had this case before, and I arrive at the conclusion that we are bound to find out the meaning of the words used.

Baron Bramwell: I think I may venture to say that the former case was a different one. I do not mean that it was not the same defendant or plaintiff, but I think the same questions did not arise then as now.

Baron Martin: I think not. I remember there was a discussion upon it.

Baron Bramwell: I have a very strong opinion that the event of the former trial had no influence upon this—had nothing to do with it.

Mr. Bovill: It was in this way: At the former trial it came out that the carbonate of iron was something of the same kind as the oxide of iron.

Baron Bramwell: You gave that up at Guildford, Mr. Bovill, and confessed that there was nothing in it. What is the use of making confusion worse confounded, by bringing it up again?

Mr. Bovill: At the former trial there was a question as to carbonate of iron. Evidence was given that it was oxide of iron, and upon that the Lord Chief Baron stopped the case, and the other points were not gone into discussion.

Baron Bramwell: With the additional information and evidence it turned out that Mr. Bovill could not sustain his point at all, and he gave it up. It is really a pity that in so perplexing a case as this we should have any other matters introduced.

Mr. Bovill: I have not raised the question.

Baron Bramwell: Then why mention it?

Mr. Bovill: Only to show that it does not arise in this case.

The Lord Chief Baron: You are, in fact, adopting the process of purifying our minds and renovating the material.

The Attorney-General said he would now endeavour to submit to the court his own opinion of what the proposition was which the defendants had to make out to the satisfaction of the court, in order to succeed in relation to either of these hostile patents.

Baron Bramwell: I hope I may say, not inconveniently now, that your client claims briefly two things, the use of hydrated oxide of iron, and the renovating of that material.

The Attorney-General said that expressed in ten or twelve words that which was his claim. Upon the question of the rival patents he would say that it must be proved, before the defendants could succeed with this rule, that the patent of Croll published and disclosed to the world, at an earlier period than the plaintiff's, the invention, or a material part of the invention which he now claimed. It was not whether a chemist or a learned man, or even an ordinary operator, might, with the aid of great knowledge and experience, and by means of a succession of experiments and efforts, succeed in discovering, by the light of the earlier patents, the same thing which had been claimed to be discovered by the plaintiff, and for which he had obtained letters patent—that would not avoid his patent. He (the Attorney-General) took it that the law was—and upon this and every other point in the patent law, it was well to look back to the words of the statute upon which all must turn—it must be something not new or in public use or public knowledge before the date of the patent in question. Croll's patent, therefore, to avoid Hills' patent, must have declared and published to the world the invention, or a material portion of plaintiff's invention. If he had done so, sad as might be the consequence to Mr. Hills, he must, of course, bow to the law.

Baron Martin: Supposing the plaintiff's patent was an infringement of Croll's patent, could he maintain his patent?

The Attorney-General: He might, as an improvement upon Croll's process.

The Lord Chief Baron: He must not take out a patent the effect of

which would be to prevent a man from using that for which he has got another patent.

Baron BRAMWELL: I think that will not arise.

Baron MARTIN: We have had a case in the Exchequer Chamber (*Brooke and Aston*) which was an infringement of a patent for improvement in thread made from vegetable matter, and it was contended that a man might afterwards obtain a patent for the same process as applied to wool.

The ATTORNEY-GENERAL proceeded to read Croll's specification, from which he said it was manifest to every one at all acquainted with chemistry, or who had derived any knowledge from the facts of this case, that Croll had no more idea of telling mankind that gas might be purified from sulphuretted hydrogen by hydrated oxide of iron than that it might be purified by means of sea-water. Indeed, Mr. Croll himself when examined candidly admitted that at the time he took out his patent he did not know the difference between hydrated and anhydrous oxides.

The LORD CHIEF BARON: How long has this been well understood?

The ATTORNEY-GENERAL replied, as long as chemistry itself—at all events, from the beginning of the present century.

Mr. BOVILL: The hydrated oxide becomes anhydrous by driving off the water at a red heat.

The ATTORNEY-GENERAL said, speaking with some knowledge of chemistry and of the processes adopted in this particular manufacture, the necessary effect of the language used in Croll's specification was to indicate the use of anhydrous oxide; and if the court should be of opinion at the close of the argument that they were bound, by whatever means they could command, to construe that specification, he ventured to say that they must come to the same conclusion. The subject of his patent—that which was put in the foreground—was the black oxide of manganese; and it would be observed that the oxides of iron and other substances mentioned were merely mentioned as alternatives which might be resorted to if preferred. But whatever were the substances indicated by him, it was a part of his process to renovate them by the application of a red heat, when, in the words of his patent, the material was fit again to be employed by being placed in the purifier, moistened with water, "as in the first instance." Here it was necessary to bring in evidence, and to assume a certain amount of knowledge in chemistry, in order to understand that the roasting to any great heat would anhydrate the oxide of iron.

Baron MARTIN: I thought we had nothing to do with the renovation here.

The ATTORNEY-GENERAL: Oh yes, my lord; it is necessary to look at every word of this, because it is a question whether Croll has published to the world that gas may be purified by the hydrated oxide of iron.

Baron BRAMWELL: I think my brother Martin will be assisted by this remark. You are now going to show that Croll must have meant an anhydrous oxide of manganese?

The ATTORNEY-GENERAL said his object was to show that Croll must have believed and intended that the article he was about to use was an anhydrous, and not a hydrated oxide.

The LORD CHIEF BARON: When the material is roasted by being put in an oven and brought to a red heat, it becomes perfectly anhydrous. When mixed with water again, does it become hydrated? If you dry a towel or ashirt, and it is then put in a tub of water again, it becomes wet.

Baron BRAMWELL: Anhydrous oxide of iron will not become hydrated by being simply mixed with water. Hydrated oxide of iron is not a wet material, but is a chemical preparation of the three ingredients mentioned—hydrogen, oxygen, and iron—chemically, and not mechanically, combined.

The ATTORNEY-GENERAL would not refer to the alternative substances mentioned by Croll, but to the chief article which he put in the foreground of his specification, and disclosed to the world the use of—viz., the black oxide of manganese, which was an anhydrous oxide.

Baron BRAMWELL: Your argument will be that what is true of the manganese is true of the oxide of iron specified; and you can prove that the black oxide of manganese is anhydrous.

The ATTORNEY-GENERAL said it was clearly the nature of the substance indicated by Croll, because he proposed to use it over and over again, "as in the first instance," after being roasted to a red heat; and, as anything roasted to a red heat must be necessarily anhydrous, he contended that this must be construed to be a patent for an anhydrous oxide. This, therefore, was no communication, and no disclosure to the public that hydrated oxide of iron would purify coal gas. They now came to the words upon which this question turned: "The same effect may be produced by the application of the oxide of zinc" (which he prayed their lordships to observe was in the singular number) "and the oxides of iron, and treated precisely in the same way as above described." Some minute degree of consideration was necessary to be bestowed upon these words. The "oxide of zinc" was in the singular number, the "oxides of iron" in the plural. Did this mean one oxide of zinc, whether hydrated or anhydrous, and both or all of the oxides of iron, hydrated and anhydrous? The meaning of this would be perfectly plain when they came to look a little into the science of chemistry or metallurgy, and it would be found that Croll was speaking in both cases of the metal in one and the same condition, which for the reasons assigned must have been in an anhydrous condition. The reason why zinc was spoken of in the singular and iron in the plural, was that there was but one degree or condition of the oxide of zinc—the protoxide—and that there were three—possibly more—conditions of iron: the protoxide, peroxide, and sesquioxide—the third being probably called magnetic.

Baron BRAMWELL: Zinc oxide is of two kinds—hydrated and anhydrous.

The ATTORNEY-GENERAL was about to make that observation, and to remark upon it that if Croll had meant to specify both, he would have used the plural number, but, inasmuch as for the reasons assigned he meant exclusively the anhydrous oxide, he used the singular only. But this became more apparent when they came to look at that part of his specification in which he said: "I claim the purification of coal gas from ammonia by means of chloride and sulphate of manganese, and muriate of iron, and sulphuric and muriatic acids; and the purification of gas from sulphuretted hydrogen by means of the oxide of manganese, the oxides of iron, and the oxide of zinc, as hereinbefore described, and as applied in the particular manner and stage of process," &c., &c.

Baron BRAMWELL: How many oxides of manganese are there?

The ATTORNEY-GENERAL said he understood from Mr. Grove that there were two; but, in order to account for this being in the singular in the extract just read, it should be mentioned that Croll was expressly speaking of the black oxide.

Baron BRAMWELL: I think before you argue this part of the case before the court, it would be well to mention that the evidence was universal that, at the time when Croll specified, it was the belief of chemists that hydrated oxide of iron would purify, but anhydrous would not.

The ATTORNEY-GENERAL: We do not admit that at all. There was a contrariety of evidence.

Baron BRAMWELL: I must report against you on that point.

Mr. MONTAGUE CHAMBERS: I think there was some evidence which rather controverted that point.

The ATTORNEY-GENERAL said, after all the evidence in the world, it could only be matter of science, and might be inquired into as to what was the universal belief or opinion; and if the evidence were examined, this point would be found to come to nothing, for Croll himself said, "At the time I did it, I had not the least notion."

Baron BRAMWELL: All I want to do is this—You are expounding this specification, and you say, read it, and it shows that the man must have been speaking of anhydrous oxide, because hydrated oxide, if brought to a red heat, would become so. At the same time, you should bear in mind that the argument was this: if you bring the chemical knowledge of the day to bear upon the question, that chemical knowledge was, that anhydrous would not purify.

The ATTORNEY-GENERAL submitted that that fact, upon which, however, the evidence was not quite uniform, would, if established, turn rather in favour of the plaintiff.

The LORD CHIEF BARON: Even for the purpose of establishing and setting up a patent, I do not know that it is to be taken that the patentee is so well acquainted with the science of chemistry that it is impossible for him to have made a mistake, and to have imagined it was something which it was not.

The ATTORNEY-GENERAL said one of two things must be supposed in this case—either that the patentee meant the use of anhydrous oxide in the first place, or that he was ignorant of the fact that by roasting the hydrated oxide to a red heat it became anhydrous, and consequently unfit for use.

Baron MARTIN: I should expect that this is not so. He tells you that in undergoing the first process it will absorb sulphur, and that in order to use it again you must get rid of the sulphur, and that the mode of doing this is by roasting it in an oven. Now, here it is quite true that this would expel all the water, and make it cease to be hydrated, but how does it follow from that that the oxides of iron mentioned by him generally in the plural necessarily mean oxides free from water?

The ATTORNEY-GENERAL: Merely because of this—that if you use the same substance, whatever it may have been originally, after it has been roasted in an oven, you use a substance which is what it was not originally.

Baron MARTIN: Your statement was that it would be useless.

Baron BRAMWELL: In summing up to the jury I made this remark:—"It appears that the prevalent notion at that time was that anhydrous oxides would not purify. It seems now to be the opinion that anhydrous oxides will purify; that the difference between them and the hydrated oxides consists in a difference of molecular condition; and one would rather infer from what one has heard, that if you unhydrated hydrated oxide, so as to make it anhydrous, then anhydrous oxide will purify the gas from sulphuretted hydrogen; whereas if you get anhydrous oxide by some other means, in all probability it would not purify." It is, therefore, not impossible that Mr. Croll empirically treated both the oxides, using the hydrated and anhydrous, and turning the hydrated into an anhydrous one by roasting, which still, by its molecular condition, was capable of purifying.

The ATTORNEY-GENERAL thought that that was, in the first place, assuming a great fact in philosophy, and in the second that the jury had returned a wrong verdict. He did not see how any patent might not be avoided if they were to import evidence in this way. He insisted now, as he did before the jury, that the whole of this was contrary to fact, and that the material was perfectly useless. If that process would have purified gas, why, with the immense quantity of gas manufactured in the kingdom between 1840 and 1849, was it not resorted to? It might, according to the testimony of some witnesses, have done so; but he contended it was, in reality, contrary to fact, and so the jury had found it. But the question for the court now was not whether Croll did or could effect a certain purpose, but whether he did, in plain and intelligible language, communicate to the world the invention, or a material part of the invention, of Mr. Hills. If, under the generic term "oxides of iron," he included four or five substances, one of which only, the hydrated oxide, would effect the purpose, he (the Attorney-General) submitted with perfect confidence that this would not be sufficient to invalidate the patent of another person who subsequently took out a patent for the hydrated oxide only.

Baron MARTIN: All we know at present is what is contained in the specification; and how do we know that oxide of iron will purify?

The ATTORNEY-GENERAL said it was impossible to determine that upon the mere specification, and the court must resort to evidence.

Baron MARTIN said the question was whether Mr. Croll, having in 1840 taken out a patent for all oxides, another person in 1849 could take out a patent for one description of oxide.

The ATTORNEY-GENERAL said if it be held that a subsequent patentee could not, it must be because the first patentee had taken out a good patent, and secured to himself the exclusive use of every description of article which could be included under the term "oxides of iron."

Baron BRAMWELL said it might be a bad patent if the first patentee had not specified them particularly, but supposing he had said *all* oxides.

The ATTORNEY-GENERAL in that case would say that it was repugnant to common sense and justice to exclude another from patenting one oxide which would do it.

Baron BRAMWELL: But supposing he had gone further, and said "all oxides, hydrated and anhydrous," would that be sufficient?

The ATTORNEY-GENERAL conceived it would not, as the terms were too general. Where was the thing to stop? A man might, if such a course were sanctioned, take out a patent for all the metallic oxides.

Baron MARTIN: What would you say to this? Common hens' eggs are used in the place of isinglass in the preparation of cotton goods. Supposing a man had discovered that, and took out a patent for the application of the eggs of *all* birds for the finishing of cotton goods; another man afterwards took out a patent for the use of hens' eggs for that purpose, would that be a good patent?

The ATTORNEY-GENERAL submitted that that must depend upon the question of whether the first patent was good.

The LORD CHIEF BARON: No; the patent may be bad for other reasons, and yet good enough to exclude another person from taking out a second.

The ATTORNEY-GENERAL quite agreed that this was an apt illustration, for the eggs of birds, though they differed in their qualities, might be all applicable to the purpose.

The LORD CHIEF BARON: It might be a bad patent, because the eggs of all birds would not do. It might turn out that the eggs of birds were of two sorts—those which when boiled were transparent, as the plover's; and those which were opaque, as the crow or common hen's. Most of the small birds which you find in this country have eggs which boil transparent; supposing the transparent eggs would answer and the others would not, the patent might be bad, and yet no man afterwards could take out a patent for the use of the eggs of birds that would boil transparent.

The ATTORNEY-GENERAL thought that if a man took out a patent for the

application of the eggs of birds of which there were at least 200 varieties, and only one of these would answer the purpose, it would be monstrous to say that he should be able to restrain all mankind from the use of that one which was of any use. A man who took out a patent for two things, one of which was misdescribed, might have a bad patent, but if he had published to the world that second article, and shown that it might be used, another man could not take out a patent for it. But if he made his patent so large, by the use of a generic term, that it did not disclose to the world what were the specific substances upon which he relied, and, moreover, if the terms employed were so large that he conferred no benefit upon the world, the consequence would be that any ignorant man might be the means of preventing further discoveries in that direction, and further endeavours to ascertain for the good of the community whether one or more of the substances included under that term might not effect the purpose. Again, it might be a question whether, by the use of such a generic term, a deception was not practised upon the public, and, instead of information being communicated to them, they were misled by the patentee. Looking, therefore, at the specification of Croll, he contended that their lordships could not judicially construe it, but must call in the aid of evidence, and submit that evidence under the direction of the court to a jury.

Their lordships having consulted, the LORD CHIEF BARON said he thought the Attorney-General should proceed to deal with Laming's patent before the other learned counsel addressed the court.

The ATTORNEY-GENERAL said he would endeavour in a single sentence to tell their lordships what he conceived Laming's patent to be; and he believed the mere statement of it would show that it was something totally different to Hills'. Laming's was a patent for the purification of gas by the chloride of calcium, prepared in the way which he pointed out, while Hills' was a process of purification by the hydrated oxide of iron. All that was common to either was the occasional mixing (which was optional or permissive) of the chloride of calcium and of the hydrated oxide of iron with certain other ingredients; but there was nothing in the claim of Laming which could at all invalidate the claim of Hills in this respect.

Baron BRAMWELL: I think we may put it thus:—The defendant would say, Laming claims the use of chloride of calcium. He says incidentally, I use the oxide of iron because I find it mixed with it. The plaintiff says, I claim hydrated oxide of iron, and I use it with chloride of calcium.

The ATTORNEY-GENERAL: No, my lord, never; he disclaims it, and claims the hydrate. Laming undoubtedly claims to apply to this purpose chloride of calcium, and in pointing out certain processes by which it may be obtained he mentions one in which the oxide of iron will be found.

The LORD CHIEF BARON: He says, "In such cases the oxides which result are useful for such purification, and need not be removed." The probability is, that he thought the merit was in the chloride of calcium, but it was in the other.

Baron BRAMWELL: He did not think the merit was in the oxide, but he thought he had infringed Croll's patent, and he said so.

The LORD CHIEF BARON: He says, do not remove them, because they are useful. It turns out that substantially they are the only things that are useful

The ATTORNEY-GENERAL: It is not exactly so. For the purpose of the patent of Hills, the hydrated oxide of iron, as we maintain and as the jury found, is the only substance by which it can be effected, and chloride of calcium is noxious and injurious for that purpose. But for the other purpose chloride of calcium is useful. [The learned counsel proceeded to read extracts from Laming's specification.]

The LORD CHIEF BARON said the way in which the objection would present itself would be this—that Laming used a metallic oxide mixed with chloride of calcium. It might be that the whole benefit for the purpose of getting rid of the sulphuretted hydrogen was in the oxide, and not at all in the chloride; but the question which arose was, whether a patent could be taken out for the use of that alone which had already been patented in a combination.

The ATTORNEY-GENERAL contended that the subject and object of Laming's specification was the chloride of calcium, in preparing which an oxide was produced.

The LORD CHIEF BARON said the consequence would be, that if a subsequent patent for the metallic oxide were taken out, he could not afterwards use it mixed with chloride of calcium.

The ATTORNEY-GENERAL said there was nothing to prevent a person taking out a patent for one or two ingredients only which were contained in a substance composed of twenty, and for which a previous patent had been obtained.

The LORD CHIEF BARON said he thought a man might take out a patent for an improvement and tell the world that by the use of these two or three ingredients a better result would be secured.

The ATTORNEY-GENERAL proceeded with the reading of Laming's specification, again pointing out that the chloride of calcium was the thing patented, that the oxide was only an incident in the process of manufacture, and that the patentee merely said, In the production of the chloride of calcium you will obtain something else, but as that will aid in the purification, do not reject it.

The LORD CHIEF BARON: That is telling the world that the oxides or carbonates will do.

The ATTORNEY-GENERAL: No, nothing like it; he says you will have something else in the mixture with the chloride which will rather help than hurt it.

The LORD CHIEF BARON: He does not say "rather help;" you are throwing in words now and then.

Baron BRAMWELL: I think I ought to add a fact about which there is no doubt. Hills states in his specification how the metallic oxide may be prepared; it is no part of his specification, but he does do it, and it was stated in evidence that it was prepared in such a way that the same mixture was produced as Laming speaks of. Hills does not say in his patent, "I use that mixture;" but his own witnesses say it would not only be inconvenient, but a great injury to remove it. They prove, in point of fact, that Hills uses the same mixture with one exception. The difference is, that whereas Laming makes his mixture with chloride of calcium, which is a muriate, Hills makes his with a sulphate and leaves out the muriate.

The ATTORNEY-GENERAL: Either with a muriate or sulphate.

Baron BRAMWELL: Never. Whenever he has occasion to speak of iron he always says sulphate; when he mentions other things, it is a muriate or sulphate. I am not sure whether the last consideration I have mentioned does not remove this from the province of the court and leave it with the jury. There was a witness upon this, and it turned out that Laming's calcium resulted in a mixture of lime and iron, but it was prepared with a muriate; Hills' results practically (I do not say in his patent it is so) in a mixture of lime and iron, but it was prepared with a sulphate, and there was evidence given that the mixture so made was useful for purification, but when made with a muriate it was not, because it was then a delequescent substance.

The ATTORNEY-GENERAL: The direct question was left by your lordship to the jury—whether the one was an equivalent for the other; and the jury, I hope I may say, most justly and rightly and unhesitatingly found they were not. If they had found they were equivalents, then the verdict would have been for the defendants. I can only, therefore, argue that they are totally different ingredients producing different effects.

The LORD CHIEF BARON: Laming says, "I do not claim either of these processes for making a mixture of chloride of calcium and a metallic oxide or carbonate, but I do claim the application of mixtures so made to the purification of coal gas."

Baron BRAMWELL: "So made."

The ATTORNEY-GENERAL: I quite agreed at the trial that he has claimed, in addition to the chloride of calcium, whatever in making it is produced.

The LORD CHIEF BARON: The hydrated oxide of iron?

The ATTORNEY-GENERAL: We deny that it is hydrated oxide.

Baron MARTIN: It is quite the same thing.

The ATTORNEY-GENERAL: No, it is the particular kind produced by that process.

Baron BRAMWELL: No doubt, Mr. Attorney, it is a hydrate.

The ATTORNEY-GENERAL denied that it was so, and referred at length to the evidence given by Mr. Campbell at the trial, on this point. The most that could possibly be said was that in some way or other, out of a given number of ways, by the use not of chalk, but of lime and lime moistened, a hydrated oxide might be produced.

Baron BRAMWELL: I do not want unduly to press upon you, for I think there is a strong point in your favour, but he said in the one case it would be hydrated protoxide of iron and in the other anhydrous peroxide.

The ATTORNEY-GENERAL argued that, after all, the point really was whether Laming, in his specification, told the people conversant with this trade and manufacture that hydrated oxide of iron was itself a substance which, not mixed with a variety of other things which might possibly destroy its effects altogether, but mixed with sawdust or some such thing only, would purify gas. He submitted that the question for the court, therefore, to determine was, whether, if one takes out a patent for the application of a number of substances, composed of a variety of ingredients, for the purification of gas, and points out how that substance is to be made, it deprived another of the right, if he discovered that two or three only of those ingredients would produce a better effect, from taking out a patent for that purpose. He submitted further that there was no avoidance of Hills' patent by Laming, because, as the jury must be taken to have found, the oxide produced by him was anhydrous. Laming himself knew the difference between the two, and wherever in his specification he meant to indicate that difference, he showed that he knew it; for though he nowhere used the term "anhydrous," he (the Attorney-General) contended that, upon the context and evidence, it always meant anhydrous.

Baron BRAMWELL: Upon that point I report most positively against you. Your own witnesses proved that the preparation of Laming's with lime would result in a hydrated oxide.

The ATTORNEY-GENERAL: What our witnesses said was, that it could not be done without heat, and that that would produce an anhydrous oxide.

Baron BRAMWELL: I must report to the court that it is not so, and that the evidence on all sides was that the preparation with lime produced a hydrated oxide.

The ATTORNEY-GENERAL admitted that such was the case if prepared with *wet* lime, but then the plaintiff said that, looking at the context and the whole of the specification, it indicated that it was to be done, not with wet lime, but with chalk. All he would say in conclusion upon this point was, that if their lordships could, without the aid of any evidence at all, take upon themselves to consider the whole of both of these specifications, and without any assumption either one way or the other that anything that might be controverted was matter of fact, he believed they would find that in construing Laming's there was nothing which approached a resemblance to, and certainly nothing that was identical with the plaintiff's. If, on the other hand, the court should think it necessary for one purpose or another, in going through these specifications, to determine a question of fact, that fact must be taken, not from the conclusions of counsel or even the report of the judge, but the evidence taken at the trial must be brought before the court, and if on any question it should appear that the opinion of the jury was not taken, it could only be done by taking it before another jury. If in substance it had been so left, then the question of fact must be assumed to be determined in favour of the plaintiff. He would only add a few words respecting Hills' specification. The plaintiff said—speaking of the mode in which he prepared the material for which his patent was obtained—the plaintiff said: "Hydrated or precipitated oxide of iron may be conveniently prepared by decomposing sulphate or muriate of iron with hydro-sulphuret of ammonia, or with lime, &c." Now, what he understood to be the objection raised upon this sentence was, that if, with a view to prepare hydrated oxide, he decomposed muriate of iron with lime, he had not merely the precipitated or hydrated oxide, but a liquor or substance above it, mechanically speaking, and an addition to it, which in effect was the chloride of calcium. This in effect was saying nothing more than that, in order to obtain the hydrated oxide of iron, you may resort to a process which at the same time will produce the chloride. But it was assumed at the trial, that because the two were produced together he used the two, and that so in effect the plaintiff directed the use for the purpose of purifying gas of that which was produced under Laming's patent. The answer to that was simply this: it is quite true that by decomposing muriate of iron with lime you may produce an oxide of iron and also a chloride of calcium, but there is not the least pretence for saying that by this specification Hills points out to the public that chloride of calcium is to be used, either separately or in combination with the oxide with which it is combined. On the contrary, the plaintiff in the next sentence said: "They may then be absorbed into, or mixed with sawdust, peat, charcoal, breeze, or other such material, and afterwards exposed to the air."

Baron BRAMWELL: From which it was inferred that he intended the oxides should be separated from the mixtures and used by themselves.

The ATTORNEY-GENERAL: Yes, of course; any one reading it would.

Baron BRAMWELL: Any one *might* infer it, and that not improperly; but the man who made the stuff proved that he always made it with the sulphate, and never did separate it.

The ATTORNEY-GENERAL: No, my lord; that is another part of the specification.

Baron BRAMWELL: I am quite sure I am right. The witness said, "I never use the muriate; I use the sulphate invariably, and I never separate the sulphate of lime, but always use them together."

The ATTORNEY-GENERAL said, on the next page the plaintiff pointed ou;

alternative modes of producing the hydrated oxide of iron, one of which was using it together with the sulphate of lime, and another with the muriate of magnesia; and he agreed that he here said it might be either used alone or mixed with the sulphate of lime. It was upon this the argument arose on the part of the defendants that this was a mere colourable imitation, chloride of calcium and chloride of lime being the same, not in substance exactly, but in the effects they produced in the purification of gas, and that therefore these were equivalents the one for the other, and consequently the patent was void. What was the answer to it? Independently of the fact that it was merely put as an alternative, the question was put in plain terms to the jury (and the learned judge did not spare the plaintiff on that occasion), and they gave their verdict in his favour on this point also. This objection, therefore, he apprehended, fell to the ground. Mr. Miller was expressly asked by the judge, "Is there anything to indicate the presence of chloride of calcium, or any other substance of that sort, in Hills' specification?" and he replied, "Certainly not of chloride of calcium;—sulphate of lime, which is quite a different thing. It is not delequescent."

Baron BRAMWELL: I quite agree with you that the jury have found it in your favour that they are not equivalent.

The ATTORNEY-GENERAL concluded his argument by saying that the question for their lordships was not whether some ingenious and persevering man, taking Croll's and Laming's patents into his hands, and speculating and experimenting upon them for a series of years, could, by the suggestions and hints to be derived from one or the other, at length light upon the discovery which Mr. Hills had made, but the question was, whether their lordships could judicially hold one or other of these earlier patents to be a disclosure to the public that hydrated oxide of iron, unmixed with chloride of calcium, and mixed only with those ingredients to which Mr. Hills referred in his specification, would of itself effect completely and perfectly the purification of gas. Unless they found this to be the case, the plaintiff's patent must be considered to be established by the verdict of the jury, and this rule must be discharged.

Mr. MONTAGUE CHAMBERS followed on the same side. He commenced by adverting to "the acknowledged ignorance of the minds of the judges of the land," and their admitted "incompetency with reference to the understanding of chemical terms," grounding his remark upon an inquiry made by Mr. Baron Martin during the Attorney-General's argument, to be furnished with a chemical dictionary in which he should find an explanation of the term "oxide." He then proceeded to show what was the clear principle laid down by the judges in reference to construing specifications side by side. He referred to the case of *Bush and Fox*, in which it was decided by the House of Lords that in an action for an alleged infringement of a patent, where the evidence is that the supposed invention is not new, the judge may compare the plaintiff's specification with the specification of a previous patent, and may on such comparison direct the jury to find a verdict. In looking to that case he found there were no controverted facts, no difficulties with regard to terms of art—that both sides agreed as to their meaning; so that a man of ordinary understanding might have taken the two patents and placed them side by side. But he also found that in that case evidence was given with reference to the nature of the two inventions, and that thereupon the Lord Chief Baron had directed the jury that the specifications were identical. It was quite impossible, however, to say that the judicial mind could by possibility in scientific cases be able to direct a jury on every question, whether of chemistry or of mechanism, without the aid and assistance of scientific men, whose attention had been given to the particular subject, making it a mixed question of law and fact—the jury to find on the facts, and the judge on the law. In the present case there had been a controversy between chemists who were called as witnesses on the one side or the other.

Baron WATSON: Upon what points?

Mr. CHAMBERS said, upon the question of hydrated and anhydrous oxides; those called on behalf of the plaintiff saying that Croll's patent indicated the use of anhydrous oxides only. [The learned counsel read portions of the judge's summing up to the jury on this point.]

Baron BRAMWELL said, in his own justification, he should say, in reference to that portion of his summing up which had been read, that the question was raised whether, taking Croll's specification and practice together, they did not indicate the use of a hydrate. Otherwise, he did not know that he should have been justified in leaving the construction to the jury.

Baron MARTIN: I should think not.

Mr. DENMAN: It was done by consent, we having a case reserved.

Baron BRAMWELL: Yes, I think it was; we all felt we had a very difficult nut to crack.

Baron MARTIN: Have you any authority for saying that it is a question for the jury what is the meaning of an English word—what is the meaning of a specification?

Mr. CHAMBERS said he should think it was the very A B C of the profession, that on all words of skill and of a particular profession you were entitled to call in competently skilful men.

Baron MARTIN was of opinion that it was a matter for the judge to ascertain the meaning of every English word, and to read a document giving a meaning to it, and that it was not a question for the jury at all.

Baron WATSON said it had been laid down in one of the cases that a witness might be asked—What are net profits? but that he could not be asked—What are net profits in a particular document?

Mr. CHAMBERS submitted that it was for persons engaged in a particular trade to give the meaning of a trade term in use among them, and then for the judge to construe the whole document by the light of that extrinsic evidence. In the present case, witnesses were called who proved that the article produced by the roasting process would be anhydrous, and they showed beyond that, that it was the anhydrous which was used throughout the whole process.

Baron BRAMWELL said he thought it was for him to say what was the meaning of "oxide," but he thought if it could have been made out to demonstration that the context of the specification meant anhydrous oxide alone should be used, he ought to have said to the jury: "If you believe such and such evidence of such and such a fact, I tell you this specification means anhydrous oxide." The learned counsel would have to make out that his evidence showed that Croll could not use hydrated oxide of iron under his process.

Mr. CHAMBERS: Not so, my lord. I think that is pressing us rather too far.

Baron BRAMWELL: If he could use both, it may mean both; and if it may, it does mean it.

Mr. CHAMBERS said what he meant was, that they were not to arrive at the question whether he could or could not produce an article in a certain condition by improved science, but whether he had stated clearly that he intended to use it. He was very desirous to limit himself to the question of Croll's disclosure—the validity of his patent for the moment being put aside. Supposing Croll had put it in this equivocal way: "It is not certain what I intend to use, or in what condition I intend to use it," and another person, by a series of elaborate experiments, found out that the article upon which he operated could be used in a given state or condition, he (Mr. Chambers) apprehended that the equivocal and uncertain way in which the original patentee had expressed himself would not preclude the subsequent party from saying, I have made a new discovery. But supposing he made his disclosure, or gave his information in such a way as to lead a scientific man to conclude that what he intended to use was A, and that every scientific man would inevitably be led to the conclusion that he must use A, but it turned out upon experiment that B might be used—then he apprehended that, as far as novelty was concerned, the man who used B was not deprived of his invention. It was in that sense only that he submitted to their lordships that, with regard to the novelty of invention, or, in other words, the disclosure to the world of the whole invention, scientific men might be called in to say what would you proceed to do, after hearing what the person who publishes the matter says he does. That would be legitimate and fair evidence on the issue of publication or non-publication.

Baron BRAMWELL said, if a man said he knew nothing of the specification, but had got the matter by heart, that would be a question for the jury. It is very odd if a man stating what he has done raises a question for the jury; and, if he puts a specification in, it is for the judge.

Baron MARTIN: The law requires a specification to be in writing.

Mr. CHAMBERS said it did not require a publication to be in writing, and he thought that this was the error into which they were falling. It had nothing to do with a patent, and was the same as though published in a newspaper. When the question of novelty was to be looked at, the prior patent was out of the question. If a man disclosed his invention by word of mouth, or in a letter, or by showing the machine or ingredient which he had discovered, to other persons, it was still a question for the jury.

Baron WATSON said the learned counsel might have done this—he might say, Take all the ingredients mentioned here, and what will they produce?—will they produce an oxide? He could ask, what would be the result? but he could not ask, what is the meaning of the specification?

Baron MARTIN requested Mr. Chambers to look into the question, and see whether it was not for the court to put a meaning upon all English words, and that they must do it, though they might get the assistance of a jury in some cases; and also whether a man must not be taken to have published that which by law was considered to be the meaning of his specification.

FRIDAY, JUNE 10.

Mr. CHAMBERS, in reference to what dropped from the court yesterday, said he had looked into the latest books on evidence, and he cited some cases to show that it was absolutely essential in these cases that the assistance of witnesses should be required, and that the jury should determine on the whole matter, being directed by the judge in reference to what their duties are. Mr. Taylor, in his work on the "Laws of Evidence," thus stated the matter:—"It has been recently laid down as a general rule of law that the construction of all written documents—which term it is presumed would necessarily include Acts of Parliament, judicial records, deeds, leases, agreements or letters—belongs to the court alone, whose duty it is to construe all such instruments as soon as the true meaning of the words in which they are couched, and the surrounding circumstances, if any, have been ascertained as facts by the jury, and it is the duty of the jury to take the construction from the court, either absolutely, if there be no words to be construed, as words of art and phrases used in commerce, and no surrounding circumstances to be ascertained—or conditionally, when those words or circumstances are necessarily referred to. Unless this were so, there would be no certainty in the law; for a misconstruction by the court is the proper subject for a bill of exceptions in a court of error; but a misconstruction by a jury cannot in any way be effectually set right." Then he went on to say: "Thus the court will construe the specification upon a patent, though the interpretation of such an instrument refers to matters of skill, and seems a proper subject for a jury," &c. Referring this general doctrine to Croll's invention, he said—and taking his statement as the declaration of a prior invention—the court must, according to the rule here laid down, call in the aid of witnesses to construe technical expressions, expressions of science not generally known to the public, but peculiar to persons of competent skill and knowledge in chemistry. If so, then the court ought not of themselves to place that statement side by side with the specification of Hills and say the two were identical. Unless evidence were given, the court would not be competent to construe the statement; and if evidence were given, then they must be guided by what the respective witnesses said. Having enlarged upon these points, the learned counsel adverted to the several matters argued by the Attorney-General yesterday, and concluded by remarking that in the case of Laming's patent still more than Croll's, the necessity for calling in the aid of scientific witnesses to give the meaning of words and describe the effects produced was apparent. It involved matters of minute chemistry, upon which, however, as the Attorney-General had gone over them, and Mr. Grove had to follow, it would be impertinent for him to go over. He would therefore only make this general observation, that the evidence disclosed the use of an article by Laming which was totally distinct and different from that which was discovered and made use of by Mr. Hills.

Mr. GROVE said, before he came to the specification, he would say a few words only in support of what had fallen from Mr. Chambers as to how far any question arising, not upon the chemical construction or legal effect, but what was disclosed, or might be taken to be disclosed, was for the jury. As far as he was able to gather the opinion of the court, from what had fallen from one or two members of it, a witness might very properly be asked the meaning of the term "oxide," and they might go a step further, and say, What is the result of a certain process? Now, he submitted that even a step beyond this might be taken; witnesses might be called, and the jury might be asked, "What did the patentee mean by certain expressions in this document?" First of all, he would take the point of Baron Bramwell's summing up at the trial, which, as he (Mr. Grove) submitted, expressed rightly what was for the jury to determine. In reference to the question whether Croll used hydrated or anydrous oxide, the learned judge said to the jury, "The learned counsel for the plaintiff says that he could not have meant hydrated, because he shows you that he turned it into anhydrous. That is what the specification states upon the face of it. What conclusion you may come to upon it, I really do not pretend to speculate upon. What you would say that the specification would communicate to the minds of those who read it, is a matter for you to express an opinion upon, and not for me." He (Mr. Grove) apprehended that it was so. It might be that there was no dispute upon the terms, or upon the results, or upon the sense in which a particular term was used, then the construction of the document was wholly for the court; but if there was a dispute upon any of these three

elements, then it was for the jury and not the court. Supposing a patent were taken out for chloride of calcium, and supposing instead of saying chloride of calcium the patentee had said, "I take the metal calcium, and I take the gas chlorine, and I put them together, and they result in a compound which I use in such and such a way." Now, the court could not know the result of the compound. Another patentee said—"I use chloride of calcium." It was quite impossible for the court to know that it is the same thing. But supposing a word which in chemistry had undergone changes of meaning were in question. Take the word "salt," which originally meant nothing more than sea-water, which had gradually come to represent an alkali and an acid, and which had been still further expanded of late years. The chloride of calcium would be by a large number of chemists called a salt and by a large number not; and, supposing a chemical patentee to say, "I take a salt for the process," was it not for the jury to say in what sense the word was used? or could the court, without hearing evidence, say whether the patentee used the word in the sense of the old school or the new—in its enlarged or in its contracted meaning? No dictionary would assist the court, nor would any specification inform them; it could only be ascertained from witnesses speaking in the language of the day, and looking at the manner in which it was used. If that course were not adopted, the judge, in such cases as the present, must make himself the arbitrator between two schools of chemistry.

Baron MARTIN said he apprehended that in the construction of a document the judge was entitled to receive every information which would enable him to ascertain what it was the parties meant by the expressions used. His strong impression was, that the mere meaning of a word—what is oxide of iron?—if a witness were asked that question, the answer would be directly to the judge's mind, and that it would be the same as though he looked into a dictionary, his decision upon the matter being subject to revision in a court of error.

The LORD CHIEF BARON said he entirely agreed with what had fallen from his brother Martin. A witness was not asked the meaning of a word in any other way than this—"In a particular trade or locality is it used in a sense different from what it obtains in another part of the country?" And his opinion was, that if a judge were acquainted with any subject—chemistry, astronomy, or medicine, as well as law—if he had confidence in his own knowledge, he had no occasion to ask any one, but had a right to say, the meaning of this in a written document is so and so.

Mr. GROVE said the proposition he was submitting was this, that granted the data, the construction, the grammatical and legal effect of the specification was for the court, but if there was any dispute about words, supposing them to be terms of art, or as to the result of processes, or in what sense the term was used, supposing it to be open to two senses was for the jury, and that *then* the construction was for the court. He had instanced the word "salt," which had come in the present day to include a vast variety of substances which it did not include twenty years ago.

The LORD CHIEF BARON: It certainly does not include salt that has lost its savour.

Baron MARTIN asked whether, if a judge, knowing the matter of these patents as well as Mr. Grove himself did, was trying the case, and a witness was called to prove that black oxide of manganese was a totally different thing, the judge was to say he would not hear him?

Mr. GROVE said he must try the case as any other judge would, and because he knew any trade terms or terms of art he must not import his peculiar knowledge into the case.

Baron BRAMWELL said he knew what "bell-metal" meant, but he was not bound to know what its constituents were. He might be bound to know what salt was, but was not bound to know that it was chloride of sodium.

Mr. GROVE argued at some length that these were all questions for the jury; that a court of justice could not be supposed to know all the synonyms and diversities of terms of art; that the peculiar information upon such subjects which a judge might possess must not be imported into the case; and that it was a matter entirely of evidence upon which to take the opinion of a jury. The question for the jury in this case was: Has Mr. Croll, in terms sufficiently clear and distinct, which the scientific public ought to understand, indicated the discovery of Mr. Hills? With regard to this patent of Croll, he ventured to regard this as a test. They were inquiring, not into the validity or novelty of Croll's patent, or into the question of the infringement by Hills of Croll's patent. It might be an infringement of Croll's, and yet a perfectly good patent for an improvement—good after the termination of Croll's, and good during its continuance by licence from him. But he apprehended the question was—whether Croll's specification, reading it *per se*, and as a chemist would read it, necessarily disclosed to the public Mr. Hills' invention; and for the purpose of that argument, he would submit that it was not a question whether it necessarily excluded it, but whether Hills' invention was fairly to be derived from it. Nor was it a question of user; for if Mr. Croll had said in such plain terms to the public that a man ought to understand that hydrated oxide of iron would purify gas, Mr. Hills was anticipated; but if he had left it in that degree of obscurity that one person out of five might by possibility fall in with the subject matter of the subsequent patent. then Croll's was not a prior publication of Hills'. Take the oxides of iron. There were at the trial one or two mentioned by the Attorney-General (magnetic iron and ferric acid were not mentioned, but he would take those mentioned at the trial), and they might be said to be innumerable: for, in addition to the hydrated and anhydrous oxide, peroxide and protoxide, the native oxides were referred to, and a great point was made with reference to Hills' specification, that a number—the far larger majority of them—would not purify gas. Now, what information did the public get? what information which could be acted upon without experiment when Mr. Croll told them to use oxide of iron? That would, *à fortiori*, include all the iron ores of the country, many of which would not effect the purpose. How were the public, by reading this specification, and without making experiments, to find out which would do so? They could follow his process literally; they could roast black oxide of manganese in an oven; but they were no more directed to take hydrated oxide of iron than they were any one of the native oxides, nor even the anhydrous, except that, by the process indicated, it would become so. On behalf of the defendants it was said that the anhydrous oxide would answer the purpose. If so, they were perfectly welcome to it. The plaintiff contended that it was the hydrated only; and how was that to be found out by Croll's specification? Take the case of a man living in the neighbourhood of Merthyr, where might be found great patches of iron ore, which was a peroxide. He read Mr. Croll's specification, and he would unquestionably take the iron which he found lying around him; but the result would be that he would not succeed, although he came fully within the terms there given. He (Mr. Grove) therefore submitted that this was not such a description and disclosure as would vitiate the plaintiff's claim. It would be a most formidable doctrine if it were held that by a general claim of this sort the discoverer of something which was subsequently found to fall within the terms of a specification, although not previously particularly indicated, should be prevented from taking a patent.

Baron WATSON: The effect of that would be to render the former patent void if your argument is good.

Mr. GROVE thought it might, but they were not now on the question of the validity of Croll's patent, or whether, having included in general terms substances which would not do, his patent might be made void. Indeed, it was the argument against the plaintiff at the trial that the hydrated or precipitated oxides included native oxides which would not purify.

Baron BRAMWELL: I think you give most potent reasons to show that Croll's patent was bad, if there is nothing to limit it.

Mr. GROVE said Mr. Croll stated that oxides of iron would purify gas; it was clear to demonstration that a great many would not, and consequently his specification was no indication upon which the public could rely, without experiment, as to what really would effect the purpose. The only thing by which Croll limited his invention was that in his claim he said, "I claim the purification of coal gas from ammonia by means of chloride and sulphate of manganese and muriate of iron and sulphuric and muriatic acids, and the purification of gas from sulphuretted hydrogen by means of the oxide of manganese, the oxide of iron," (using the word in the singular number,) "and the oxide of zinc, as hereinbefore mentioned and hereinbefore described, as applied in the particular manner and stage of the process of the manufacturing of coal gas hereinbefore mentioned, and not otherwise." Therefore he limited it to his previous description, which the plaintiff contended meant a roasted and anhydrous oxide, and it might save his patent if that view were taken of it. He (Mr. Grove) contended, first of all, that Croll's term "oxide" did not point out to the public his invention, or if it did, that which would make his patent good was, that it pointed out anhydrous oxide.

Baron BRAMWELL: Your argument strikes me forcibly. The purport of it is this: if a man, by a general statement, partly true and partly false, can be said to have indicated the truth, he might make the most general statement in the world, and say, "all oxides, salts, and other varieties of metal, will purify gas;" and then because it is partly true, as verified by subsequent experiment, it would avoid every subsequent patent.

Mr. GROVE said he apprehended the converse was fair.

Baron BRAMWELL: I rather think it did not appear as a fact that Croll had ever tried oxide.

Mr. BOVILL: He tried it, and roasted it.

Mr. GROVE reminded the court that he said the anhydrous would do, and called a witness to prove it—Mr. King. He contended that a prior publication must be such an one as fairly put the public in possession of the means of accomplishing the object without the necessity of experiments, because the gist of giving a patentee a patent was the supposition that he had gone through the process himself, and established the fact which he proclaimed. No publication could be said to be made from telling the world "something may result from experiments," but only from saying, "If you do so and so you will succeed." Similar observations in many respects to those which he had offered upon Croll's specification would apply to Laming's. He took it that what Laming had indicated was the invention of chloride of calcium as a purifying material for freeing gas from ammonia, and that what he said was this—"If you do not like to buy it, you may make it. In making, you will necessarily make some other things, but they need not be removed, because they are useful;" and then he claimed them. His second claim was this:—He said, that in order to be economical in preparing the chloride of calcium, you may also use the apparently refuse substances which are obtained in making it, and having claimed them, whatever use they might have mixed with chloride of calcium, Mr. Laming was entitled to, and the plaintiff did not seek to contest his right. So far as this particular mixture, which he had claimed, was concerned, and, as a recipe, he was entitled to it; but he (Mr. Grove) ventured to submit that Laming had not indicated to the public that hydrated oxide of iron would purify gas from sulphuretted hydrogen. He had claimed as a recipe, which he might do, but he had not given to the public a knowledge of the effects produced by the oxides. He did not do more than state empirically that the oxides so thrown down would be useful.

Baron MARTIN said he had no doubt that this specification was carefully prepared, for the purpose of evading Croll's.

Mr. GROVE said, whether that were so or not, Laming expressly limited himself to the peculiar combination named in his specification. He did not give the public the information, but rather led them away from the conclusion, that metallic oxide *per se* would purify gas, but published a specific mixture, and confined his claim to that mixture. He did not say either of these things would do by themselves, and it was perfectly obvious he could not do so, because by that he would invalidate his own patent; for, if he gave the public five elements, and knew that one only would effect the purpose, his patent would be bad. He must, therefore, be taken to have said—"As far as my information goes, the mixture only will do. Here is a certain mixture, of which I do not give you the *rationale;* I do not say how it will purify gas; but I tell you a certain number of ingredients will do it, and I confine and limit myself to the particular mixture of ingredients which I give to you;" and, *non constat*, any one of these things being taken away, the whole effect upon the gas would not be produced.

Baron MARTIN: Would it not be an infringement of Hills' patent for Laming to do what he specifies here? I am assuming that he has no patent at all, but is making his mixture of chloride of calcium as he here tells you.

Mr. GROVE: No, my lord, because Hills expressly permits it. He says—"That is not my patent. I do not claim the peroxides of iron or manganese made at a red heat, or the oxide of iron mixed with chloride of calcium."

Baron BRAMWELL: In a word, you say that Laming's patent is always for chloride of calcium, with or without the oxide, and that he never suggests a separation of the oxide; and, on the other hand, that Hills never suggests the use of a mixture?

Mr. GROVE said, Quite so. Laming patented a certain recipe or mixture, which was useful and good only as a mixture, the ingredients of which might be utterly useless, or noxious, or injurious; but the mixture, according to him, was beneficial, and he claimed it. Hills might have taken out his patent in these terms: "Whereas Laming has patented a mixture of A, B, and C, for the purification of gas, and whereas two of those elements are believed to be noxious and injurious, I take out a patent for A, and disclaim all the rest." That might be good in two ways—it might be good as a separate patent if none of the knowledge in Laming's patent was imported into it; or, second, as an improvement, if he could not use it without the license of Laming.

Baron BRAMWELL: Or he might say, "He has patented A and B, thinking the mixture is good: I, on the other hand, think the benefit is in B, and I patent that." I should think the great point in your favour would be, that

it is impossible for the court to pronounce that the one is an infringement of the other. It may be that upon competent evidence it is a question for the jury to say, does not the one suggest the other?

Mr. GROVE said, to put it at the worst both with regard to Croll and Laming, Mr. Hills' would be a perfectly good patent as an improvement, and therefore, as far as this action went, Hills would be entitled to succeed; for assuming that Laming had patented A, B, and C, Hills found out that one of these would do better than the whole three, and therefore, by dispensing with the other two, the substance was improved. All that the courts required in patents for improvements was that the patentee should disclaim the previous patent, and not seek to incorporate it. That was precisely what Mr. Hills had done. He disclaimed in terms Laming's mixture, and therefore, putting it at the worst, it was a perfectly good patent for an improvement. But he ventured to submit that neither of the previous patents disclosed to the public that the hydrated oxide of iron was the efficient material for the purification of gas from sulphuretted hydrogen. Indeed, Laming, by coming to an agreement with the plaintiff that he should have the exclusive use of anhydrous oxides, showed that he relied upon that description.

Baron BRAMWELL: There is a strong presumption in your favour, looking at the evidence, where Mr. Laming himself swore that a year after his patent he discovered the separate use of hydrated oxide.

Mr. GROVE: And patented it in France, showing that the very man who was said to be instructing the public by his specification in the use of hydrated oxide, did not know of it till afterwards.

Mr. DENMAN: That was the renovation.

Mr. GROVE said that was also in contest about Croll's. But the strongest evidence of what Laming thought upon the subject was to be found in the agreement. If he was thoroughly cognizant that he had discovered the hydrated oxide, why did he give Mr. Hills the free use of hydrated, retaining to himself the use of the anhydrous only? Why did he pay Hills a licence duty for hydrated, while Hills, in his turn, was required to pay for licence to use anhydrous? Mr. Laming had not, at the time of making his specification, as he contended, the knowledge that hydrated oxide would purify, but considered that the chloride of calcium was the main ingredient in his mixture, and he described a process which produced an anhydrous oxide.

Baron BRAMWELL: Surely, it is not so.

Mr. GROVE said it was—that is, assuming it was done in a moist way, for if he did it in the dry way, *cadit quaestio*. Neither Hills nor Laming claimed the manufacture of the process, but the one the mixture, and the other the oxide separately. It was perfectly well known that chloride of calcium and hydrated oxide of iron were to be made with muriate of iron and lime, and they neither claimed the process, but the one claimed the result in mixture, and the other the oxide distinct.

The court having consulted for a short time,

Baron BRAMWELL said: It is thought better that I should read my notes. I think the reading of a good deal of them might be saved. For instance, all that part about the *ferri carb.*, and that portion which relates to the controverted point whether they could see through a wall. [The learned baron proceeded to read his notes, commenting on them as he went on; and at the termination of the reading a conversation ensued upon the question of what points were left to the jury.]

Mr. GROVE resumed his argument, contending that because Laming by accident, in preparing his chloride of calcium, happened to have in it the substance which Hills subsequently discovered was capable of purifying gas, used by itself, the latter would have a perfectly good patent, because its separate use had not been disclosed by the former patentee.

Baron MARTIN inquired whether, supposing Croll had experimented with hydrated oxide of iron, though he was not aware that it was hydrated, and having discovered that it produced beneficial effects upon gas, took out a patent in which he simply described the material used as "oxide of iron," could any man afterwards go and take out a patent for hydrated oxide of iron?

Mr. GROVE said, Certainly not, if there was a public user.

The LORD CHIEF BARON: What do you mean by a public user?

Mr. GROVE: What a jury have found to be a public user.

Baron MARTIN: Was Croll's patent never acted upon between the time that his patent was granted in 1840 and the time that Hills obtained his in 1849?

Mr. WEBSTER: He states that he did use it, and why he discontinued to do so—which was because there were commercial considerations.

Mr. GROVE: Never to be called a public user; he made experiments.

Baron WATSON: The question of user or non-user is for the jury.

Baron BRAMWELL: If Croll published this patent, and as you say there is an indefinite number of oxides, and this patent does not direct attention to the particular oxide, if Croll had once used his patent with hydrated oxide of iron, and never done so again, would that prevent Laming getting it?

Mr. GROVE: If there was a public user it would.

Baron BRAMWELL: But supposing he only used it once, and the jury found that that was not a public user?

Mr. GROVE submitted that in that case it went for nothing, and the question of publication must rest upon what the patent itself disclosed.

Baron BRAMWELL said he thought he was right in leaving to the jury the question of Croll's specification and practice conjointly, because witnesses might be called to say they knew he was using oxide, but did not know how he used it; and others might be called who would say, we read his specification and knew how he used it. The jury said that neither the two together nor each singly was a publication.

Mr. GROVE said the other point to which he called attention was rather mixed up with the evidence, but he would confine himself to that part of it which came within the specifications, and that was, whether Croll and Laming had not in their minds, and did not give to the minds of chemists, an anhydrous oxide. That Croll's was so was evident from his describing its being used "as in the first instance," after having been roasted to a red heat; and that Laming's was in the same condition was evident by the fact that all his oxide processes (one excepted) were prepared with chalk in a dry way, and that when he described a wet process—which was when using the oxide of lead—he expressly spoke of it as a hydrated oxide. But it did not rest there, for in the beginning of the very passage in which the chloride of calcium occurred, he said—"I claim the use of chloride of calcium, prepared as above, for the purification of coal gas, and I use it in the manner in common use for hydrate of lime. I claim also the use of muriates and sulphates of iron, prepared by absorbing a strong solution of these salts respectively into sawdust, as explained with respect to chloride of calcium, but I do not claim the use of either of the aforesaid metallic salts in a fluid state, or in a state of mechanical division, and wetted, even though they be mixed with sawdust." Then he gave his reason—"In addition to the objectionable pressure caused by all fluids, metallic solutions in particular obstruct the purifying apparatus, by letting fall heavy precipitates; and the mere mechanical division of a metallic salt—such as the sulphate of iron—leaves in the centre of each fragment, however small it be, a quantity of the re-agent, on which the impurities of the gas can hardly be made to act." This threw some light upon his subsequent observations, that the oxides need not be removed. He said—"I object to heavy precipitates;" but if chloride of calcium was made in the dry way, that difficulty would not arise. Therefore he ventured to submit that, though this expression was used under a different claim, it seemed to be a general direction applicable to all; and, coupling this with the fact that all Laming's oxides except lead were found in the dry way, it threw light upon the subsequent passage, which spoke of decomposing with lime or chalk, and proved that the oxides were anhydrous. And certainly nothing could be stronger proof of this than Laming's own conduct, for it appeared that he subsequently took out a patent for these hydrated oxides, which patent was repealed by *scire facias*. He also entered into an arrangement with Hills, by which the plaintiff took the whole benefit of the hydrated, while Laming retained the exclusive use of anhydrous oxides.

Mr. WEBSTER: His French patent was for hydrated oxide of iron as well as for renovation.

Mr. GROVE said, if Mr. Laming had been satisfied that the use of hydrated oxides was within the patent now before the court, why should he take out another expressly claiming them? but perhaps this was an argument which he ought not to use. There were several minor points urged by Mr. Bovill at the trial, only some of which were urged when moving for the rule. Mr. Bovill said Hills used Laming's carbonates, because he said he used soda; and when he spoke of soda he must be taken to mean carbonate of soda; but he (Mr. Grove) was prepared to contend that nothing could be clearer than that Hills never used the carbonate.

The LORD CHIEF BARON supposed Hills did mean that he used it. The common potash and soda sold in the shops were carbonates, and, unless there was something in the specification to show that he meant caustic soda, it must be taken that he meant the soda in common use in the ordinary intercourse of life.

After some conversation upon this point,

Mr. GROVE said, even assuming that it was carbonate—which, with all deference to his lordship, he could not help thinking the way in which it was mentioned would not lead scientific men to suppose that he meant it—it did not matter, because the patentee was merely pointing it out as a mode by which the hydrated protoxide of iron might be made.

Mr. DENMAN referred to Hills' patent of 1848, in corroboration of the learned judge's view. In that patent, among many processes for purifying gas, the plaintiff spoke of soda, calling it caustic soda.

Baron BRAMWELL said the way it which it was used against the plaintiff at the trial was this: it was said the use of carbonate of soda would make a carbonate of iron in the first instance, and Laming had previously claimed the use of metallic carbonates.

Mr. GROVE: "So made," and probably having in his mind a very different thing. But, if my friend relies upon the argument about carbonate, what becomes of the argument that by carbonate Laming meant oxide?

The LORD CHIEF BARON expressed his opinion that, however absurd the name of an article might be to a chemist looking at it from his laboratory, a patentee must be understood (unless there was strong reason to suppose the contrary) to be speaking in his specification of articles of commerce in the terms in common use.

Mr. GROVE, with all submission, thought it would depend upon whether the patent were a chemical or a commercial one.

The LORD CHIEF BARON said it would depend very much upon the way in which it appeared. One must not be too pedantic on these matters, but he thought it was a question upon which the court was as competent to decide as any one else.

Mr. GROVE said the only reason he kept up the argument after the opinion expressed by the court was, that it answered a hypercritical objection on the other side. There was no doubt that Laming claimed the chloride of calcium and Hills the hydrated oxide of iron, and each might be useful. As long as hydrated peroxide was used, whether made by carbonates or not, Hills' patent was being used; but if they wanted a carbonate, and made that carbonate by Laming's specification, Hills' did not touch it and did not claim it. He did not know whether there were any other points upon which he need address the court. The broad question for consideration would be, whether Croll's and Laming's patents disclosed to the public the use of hydrated oxide of iron. He ventured to submit to the court that no ordinary chemical manufacturer reading either of those specifications, would have his attention directed to hydrated oxide as a gas purifier; and that, moreover, if he had his attention directed to it, if he had proceeded to manufacture according to the mode put forward by either, he would not have obtained a hydrated peroxide. A further remark also applied to Croll's, and that was, that if his attention were directed to it, it would also be directed to so many other things comprehended under the word "oxide," that he could not without experiment find out that it was the hydrated peroxide that purified gas.

Baron BRAMWELL: The latter part of your argument would be equally good if Croll had said hydrated, and anhydrous would do.

Mr. GROVE: I do not know that it would have been equally good, but it would have been sound. He would have got a step nearer, but he would have left much to experiment upon to the public.

Baron BRAMWELL: Because it would be said that, inasmuch as there were fifty or a hundred oxides, some hydrated and others anhydrous, no one could tell which till he had experimented; whereas, had he said "precipitated," it would have been different.

Mr. GROVE: I venture to submit that Hills says "hydrated or precipitated" not as an alternative, but as one thing.

Baron BRAMWELL: "Hydrated; that is to say, precipitated."

Mr. GROVE: Yes, "that is to say;" and he explained that they are to be used in the wet way, which are precipitated, whereas Croll did no such thing, but included all native oxides, many of which all the witnesses concurred in saying would not be efficient for the purifying of gas.

Mr. HINDMARCH followed on the same side.

SATURDAY, JUNE 11.

The LORD CHIEF BARON, addressing Mr. Hindmarch, who was about to resume his argument, said: I think it right to mention that Mr. Grove's argument made a considerable impression upon the court—that is, upon every member of the court. We are still open to hear everything that can be said on the other side; and though I cannot stop you, and should not like to, I may intimate that the impression made by Mr. Grove's argument on certain parts of the case was very powerful, and I think it may very much lessen the time which you might occupy in addressing the court. The substance of Mr. Grove's argument was this, that, reading the specifica-

tion, and applying it to the evidence, so as to explain what the specification really meant, it was impossible for the court to interpose, and by its construction of the patent, either to nonsuit or to enter a verdict for the defendants; that, therefore, as this matter must be inferred from the finding of the jury, and the jury found, as my brother Bramwell reports, everything for the plaintiff, the court could not do anything more than grant a new trial, and we have not yet heard the arguments upon that at all.

Mr. HINDMARCH then addressed the court, urging that Croll's patent contained little more than a suggestion that all oxides of iron would purify gas, and that there was nothing in his specification which would induce a person to take the hydrated oxide of iron and thus attain the beneficial results of Hills' invention. The facts of the case proved that it could not be so, for, though the whole term of Croll's patent had expired, the patentee after using his own invention for some five or six months, laid it aside altogether, so little idea had he that he had lit upon something that was useful. The only way in which it could have operated so as to defeat Hills' patent, and indeed the only way in which it was suggested that it could have done so, would be by the accidental circumstance of a person who, being told by the specification of Croll to take oxide of iron, should have taken the hydrated, and thus there might have been a user in ignorance. It had been suggested that Croll himself used it, but if he did, it did not lead him to the invention which Mr. Hills afterwards published to the world. In order to defeat Hills' patent it was not only necessary to show that the material used by him was mentioned in Croll's patent, but that the mode of using it was so described that a person reading it could perform the invention. Whether that was so or not was a question for the jury. In some cases the description was accurate, and it was clearly the same thing in one specification as in another, and then it was a question for the court. But in the present case their lordships could take no judicial notice of the fact that all oxides were porous materials. Some cases had been referred to as furnishing some authority on this point, and he might mention the case of *Heath and Unwin*, which related to a patent for the manufacture of steel, in which manganese was employed in order to purify the steel in the process of casting. The decision of the House of Lords was that, because at the date of the patent it was a known fact that those two elements would unite together and form carburet of manganese, before operating upon the steel the patent of Heath could not be upheld. The known state of facts at a particular date was an important question for consideration, and the question in the present case was what was the known state of facts at the date of Croll's patent, and he submitted that the court could not take judicial notice of that without the aid of extrinsic scientific evidence. He also called attention to the circumstance that it had been held in some well-known cases, that where a patent had been obtained for a combination of articles, another patent might be obtained for improvements effected by leaving out some of those articles. In conclusion, he referred in similar terms to Laming's specification, and submitted as the strongest proof that this patent did not disclose the use of hydrated oxide of iron, that in 1850 Mr. Laming and Mr. Evans went to the patent office for the purpose of patenting the hydrated oxide, at which time, on their solemn oath, they stated that the invention was a new one.

Mr. POLLOCK followed on the same side, and cited cases to show what points the court might judicially decide, and on what points evidence was admissible and the opinion of a jury required.

Mr. BOVILL was then heard in reply. He said, the points as they now arose before the court were matters of law, and there appeared at present not to be a very nice discrimination made by his friends on the other side as to what those points of law distinctly were, but they had rather led the court into a little error in respect to them. They began by treating it as though the point of law was simply on the specifications of the two patents—taking it as between Croll and the plaintiff; and they assumed that if any evidence at all was required, for any purpose, in explanation of the specifications, that then it ceased to be a matter of law, and became a question for the jury. This was a proposition which he proposed in the first place to controvert. There must be many instances where the construction of written instruments, though for the court, required some evidence of facts to enable the court to place a construction upon them.

Baron BRAMWELL said he quite agreed with Sir James Wigram, that they not only might, but must in every case have an identification of the parties and things spoken of. Wherever proper names of persons or places were concerned there must be extrinsic evidence, but in reference to terms of general significance it was not necessary.

Mr. BOVILL said, up to a certain point in the argument yesterday, it seemed to be assumed that if it were necessary to refer to the evidence, he could not be entitled to enter a verdict on the part of the defendants, on the ground of the specification.

Baron BRAMWELL: I quite agree with you, that that is not correct; and I rather think my brothers Martin and Watson are of the opinion that if it had been a conceded point that all oxides of iron would purify gas, and if no witness would have pledged his oath that hydrated oxide could not be used as there described, although he might have said—"I think it means anhydrous, for he shows that he roasted it afterwards, which makes it anhydrous," it would still be the duty of the judge and the court to say oxides are named; that means, all oxides. There is nothing in the context to show that it is impossible to use the hydrated, and therefore it includes the hydrated.

Mr. BOVILL said their lordships must consider, in reference to Croll's patent, that certain parole evidence was given at the close of the plaintiff's case, and no contradiction was given to it, and therefore there was no question to leave to the jury upon it. The duty of the judge, under those circumstances, was by the aid of the information given by the witnesses—uncontradicted and admitted on all hands—to construe the document. Having referred to some instances of the application of the rule of "proof of surrounding circumstances," he proceeded to apply that rule to the present case. The proof of surrounding circumstances, he said, in reference to a chemical patent, was the state of chemical knowledge at the date of that patent. Allusion had been made to Sir James Wigram's book on the admissability of evidence, and that high authority had laid it down that a written document was not to be considered ambiguous because an ignorant or uninformed man could not understand, but only when persons of competent skill and information were not able to do it.

Baron BRAMWELL: I presume that your argument will be for the purpose of showing that the word "oxide" includes the hydrated?

Mr. BOVILL said it was to show something more than that.

Baron BRAMWELL said he thought if that was the whole object, the court might relieve Mr. Bovill on the point.

Mr. BOVILL proceeded. He would like to know what was to be understood by the term oxide in its primary and ordinary sense, as commonly understood by scientific people. It was all very well for Mr. Grove, with his great ability in chemical science, to come there and talk about magnetic oxides, and a variety of others not dreamt of at the trial. The simple meaning of oxide was, iron that had been oxidized—that was, common rust, which every one understood—and common iron rust was hydrated oxide of iron. That was a description according to the ordinary natural meaning of the word—the oxygen of the atmosphere entered into chemical combination with the iron, and thus produced iron rust or hydrated oxide of iron. Was that a term, therefore, which needed to be explained by evidence? Was it not a point upon which the court was competent to give an opinion? If so, "oxide of iron" might include all descriptions of oxide, and certainly hydrated oxide.

Baron BRAMWELL: I quite agree with you.

Mr. BOVILL: Then came the next question—if evidence was admissible, was there any evidence given, and was there any question about oxides of iron in the terms of Croll's patent?

Baron BRAMWELL: I think if any person had said he cannot mean hydrated because his process must mean anhydrous, there would have been a difficulty; but no one did say so. I quite go with you in your proposition that oxides, *primâ facie*, mean hydrated and anhydrous—and the judge is bound to say so. But if any witness had said, "I tell you the process is incompatible," then the judge might say to the jury: "If you believe that, he must have meant anhydrous." But no witness said so, for though the witnesses said hydrated oxide became anhydrous by roasting, they admitted that hydrated might have been used in the first instance. That was the Attorney-General's argument, and I think that answer meets it.

Mr. BOVILL said the state of knowledge at the time of Croll's patent was that hydrated oxide of iron would absorb sulphuretted hydrogen and that anhydrous would not, and this was proved by the plaintiff's own witnesses. Now, such being the case, here was a gentleman proposing to absorb sulphuretted hydrogen by oxide of iron, which, *primâ facie*, meant ordinary rust of iron; and when he spoke of oxide for this purpose, the inference was that he spoke of that which was known to be applicable, namely, the hydrated oxide. Then, Mr. Campbell and Mr. Miller, two of the plaintiff's witnesses, were asked at the trial, and they gave very distinct evidence, as to what would be understood by the term "oxides of iron," and there was no dispute as to the meaning of the words. He (Mr. Bovill) cross-examined the plaintiff's witnesses, but gave no evidence himself on the point, being quite content about the meaning. Mr. Campbell was asked by him—"Is common rust of iron oxide of iron? Ans. Yes. Should you describe it as oxide of iron? Ans. I should. Is it the commonest form of oxide of iron? Ans. The commonest form of oxide? it is a very common form. Is it not the commonest you know of? Ans. I do not know; my experience of oxides of iron is rather beyond rust. But the commonest form of oxide of iron commonly known to the public is rust, is it not? Ans. It is. Is common rust hydrated oxide of iron? Ans. It all depends upon how it is produced. If it is produced by exposure to the atmosphere? Ans. It is hydrated peroxide of iron, produced as Mr. Hills has described." With respect to these very fine-drawn distinctions between peroxides and protoxides there was really no material difference, the one being first formed, and the other after exposure to the air. [The learned counsel read some further extracts from Mr. Campbell's evidence.]

Baron BRAMWELL: I do not understand, Mr. Bovill, what you are driving at. I believe the court are all of opinion that, *primâ facie*, "oxides" means all oxides, and that it would be my duty to tell the jury that it must mean hydrated and anhydrous, unless there was something in the process described which precluded it. What more can you want than that the court should be with you on the point?

Mr. BOVILL said he wanted the court to be with him on proper grounds.

Baron BRAMWELL: I tell you the opinion of the court is this—that as far as the Attorney-General's argument went, it would not avail the plaintiff, for it would have been my duty to tell the jury that when Croll says "oxides of iron," he means both sorts. Had any witness proved that the hydrated could not be used under that process, then it would have been my duty to say that he meant anhydrous; but no witness said that, or gave any evidence which would have warranted me in telling the jury that "oxides" was used in its less comprehensive sense. The difficulty arises out of the argument of Mr. Grove, who tells us that there is a great variety of oxides, and that the statement in the specification is untrue for including all oxides, because only some will do. Now, if the specification of Croll had said *some* of the oxides would do, that would have been no anticipation of the plaintiff's discovery, for to say that some would do would be to render experiment and investigation necessary. But if to say "some of them" is no anticipation, to say that *all* of them will is no anticipation. That is the difficulty you have to encounter.

Mr. BOVILL said parole evidence was given at the trial, that in 1840, when Croll took out his patent, hydrated alone would purify from sulphuretted hydrogen.

Baron MARTIN: Croll said he knew nothing about it.

Mr. BOVILL said that, though Croll knew nothing about it, the court, in construing his specification, could not do so upon what Croll himself knew, but must read his specification in the light of scientific men. Whether Croll knew it or not, if he employed a patent agent that person would use apt language to describe what he did.

Baron MARTIN: What you are now contending for is, that the question should have been left to the jury whether in 1840 the expression "oxides of iron" meant hydrated oxide.

Mr. BOVILL said that was not his object. He contended that it was for the judge to construe the specification, for which purpose he must know the surrounding circumstances, which, in respect to a scientific patent, must be understood to mean the state of scientific and common knowledge at the date of it.

Baron MARTIN said he apprehended that upon a disputed fact the judge might put it to the jury, but the construction of the specification was for him.

Mr. BOVILL said, in this case there was no fact in dispute, and he read and commented on several extracts from the evidence to show that such was the case.

A lengthened conversation ensued as to what questions should have been left to the jury, and whether the learned judge who tried the case might at the end of the plaintiff's case have nonsuited him upon the construction of the specification.

Mr. BOVILL then proceeded—Supposing Mr. Croll had said that *all* oxides would purify, and it so happened that he was correct, a person could not afterwards take out a patent for the use of the hydrated or the anhydrous oxide singly. Now, in 1840 it was supposed that the anhydrous would not purify; but it had since been found out that they would, and the evidence of Mr. King showed that the anhydrous were in use at Liverpool. Croll did not know that, not being a scientific man.

Baron MARTIN: If you make that out you are clearly entitled to a verdict.

Mr. BOVILL: There it stands upon the evidence uncontradicted. It was not left to the jury.

Baron BRAMWELL: What point?

Mr. BOVILL: The point as to King's evidence.

Baron BRAMWELL: You may take it as an established fact that some anhydrous oxides will do.

Mr. GROVE: Only with a red heat.

Baron BRAMWELL: But Mr. Grove's argument is that it may be that some will, but there are some of each that will not, and therefore it is a matter of experiment which will.

Mr. BOVILL would try it in this way: There were certain things known to be capable of purifying gas, and some one said oxides of iron would do it. Some one else discovers that such masses of meteoric iron, as were to be seen at the British Museum, or the *Jardin des Plantes* in Paris, were native oxides of iron, but they had no power to purify gas in consequence of a peculiarity in their molecular construction. Was it to be taken, because it was said "oxides of iron" would purify gas, that it was intended to refer to those kinds which nobody would dream of for the purpose, or only those known to be capable of absorbing sulphuretted hydrogen?

Baron BRAMWELL: Supposing Mr. Hills had said: "I read Croll's specification, and I bought a ton of hematite, and I found it would not do; I then went into Staffordshire and bought some of the red ore, but that would not do; I then said to myself perhaps he means the precipitated, and I found that would do?"

Mr. BOVILL: But can a man take out a good patent when he has been told the very thing?

Baron BRAMWELL: Suppose the expression had been "metallic oxides," and Hills said: "I first tried copper, and I found that would be too expensive; I then tried hematite, and it would not; but afterwards I tried precipitate oxide of iron and succeeded?"

Mr. BOVILL: What would be the result? Why, that Croll's would be a bad patent.

Baron BRAMWELL: Would you not call Hills the inventor?

Mr. BOVILL: No, because he is trying experiments upon what he has been told. But this case is a long way from that. It is quite clear that Croll's specification included, and would be understood to include, hydrated oxides; how, then, could another man take out a patent, and say, I claim for hydrated oxides alone? This was upon the specification itself; and then, when the evidence comes to be taken, it was uncontroverted that a person reading that specification would, *à fortiori*, take hydrated oxide to carry out the process. After some further remarks upon the law of evidence and the points to be left to the jury, the learned counsel said he would not trouble their lordships further upon the question of Croll's patent. He submitted that it was not only competent to them, but that they must take it that the evidence gave to the court the degree of knowledge possessed at the date of that patent, and which evidence had not been controverted, and on that it was for them to construe the specification. It either included the hydrated, because of the general term used, or it pointed to it because it would be so generally understood at the time. If not so construed, let them see the injustice that would be done. Mr. Croll might to-morrow use the hydrated oxide of iron to purify gas, but it would be said by the plaintiff, "I have a good patent, and you have no right to do it." When the case was tried, it was said that Croll had not adopted the process until lately; to which the answer was, that commercially the old process was the best, so long as he could get rid of the blue billy. Croll said that he found the other cheaper; but he did use it. Strange enough it was, that the thing he did use first of all was the hydrated oxide; and then he roasted it, and made it anhydrous.

Baron BRAMWELL: I think it is more in your favour. He did not make it anhydrous, because he did not heat it sufficient. He thought he applied heat sufficient to drive off the sulphur, and what he did was to revive the oxide. He used the hydrated oxide without knowing it, and he revived it without knowing it. You cannot say in fact that he revived it by Hills' process; but in effect he did, because it was by exposure to the atmosphere rather increased by heat.

Mr. BOVILL said he now came to consider Laming's patent, and he should contend that what he did was seen by Hills, and what he did was identically the thing that Hills adopted. Mr. Laming's object was for the purpose of purifying gas from sulphuretted hydrogen and from ammonia; and it was a most remarkable coincidence in this patent that whereas Laming had directed the mixing of his material with sawdust, and other convenient absorbents, that was exactly the process adopted by Hills. Hills described the preparation of hydrated or precipitated oxide of iron for purifying gas by mixing muriate of iron with lime, and Laming described the same thing by the preparation of chloride of calcium. The substances employed were the same, and the results produced were the same. On the other side it was said that Hills proposed to use the hydrated oxide of iron alone, and that Laming used the materials mixed up together. But Hills did nothing of the kind, for he said, "I take the sub-sulphates, the oxychlorides, or the hydrated or precipitated oxides of iron, either by themselves, or mixed with sulphate of lime, sulphate or muriate of magnesia, baryta, strontia, potash, or soda;" and then at the end he said: "I claim the purification of coal gas by passing it through precipitated or hydrated oxides of iron, or the sub-sulphates or oxychlorides of iron, from whatever source obtained, either by themselves, or, which is much better, made into a more porous material by being absorbed into or mixed with sawdust or breeze, or peat charcoal in coarse powder, or other porous or absorbent material, so as to be readily permeable by the gas, and either used alone or mixed with sulphate of lime, or sulphate or muriate of magnesia, potash, or soda, or in conjunction with any other purifying material at present in use for a similar purpose."

Baron BRAMWELL: The result is, that though he says you may prepare the hydrate with muriate of iron, yet after having prepared it, he never used the compound that resulted from it.

Mr. BOVILL: He does not claim it.

Baron BRAMWELL: You are right; I should not say he does not use it. And it is really absurd that he would have used muriate of iron indifferently with sulphate of iron, when, if he had, he would have had to remove his chloride of calcium that would have resulted, and then have afterwards mixed sulphate of lime with it.

Mr. BOVILL: Laming says, "Take muriate of iron and lime," and he calls it chloride of calcium. Hills says, "Prepare your hydrated oxide of iron with muriate of iron and lime," and he called the substance produced hydrated oxide of iron, the fact being that the mixture that resulted was partly chloride of calcium, and partly hydrated oxide of iron.

Baron BRAMWELL: If he had said in his claim—I prefer to use it alone, *or* mixed with muriate *or* sulphate of lime, he would be identical.

Mr. BOVILL: Exactly; but it is not a question whether he has claimed it, but whether he has described, though under another name, exactly the way in which Laming describes gas is to be purified.

Baron BRAMWELL: Hills never uses muriate of iron with lime, but whenever he has to deal with manganese or strontia, or potash or soda, he is content to take a muriate. That is because Laming never mentions strontia or potash or soda, so that Hills can afford to say it.

Mr. BOVILL said Laming in his patent said he preferred to precipitate by means of a muriate or sulphate. If he precipitated by means of a sulphate, he got a sulphate, which was the very thing that Hills claimed. Hills proposed to decompose sulphate or muriate of iron by means of hydro-sulphuret of ammonia, and Laming by means of ammoniacal or gas liquor; so that in every point, step by step, Hills had taken Laming's invention, and then because Laming had not claimed everything, he using the same things, called them by different names, and claimed for himself the invention.

Baron BRAMWELL: Your argument goes to show that there is a colourable imitation. All these are questions of fact for the jury. Laming says he uses muriate of iron and lime, and a mixture will result of muriate of lime and oxide of iron. The plaintiff never says that, but he says, "use oxide of iron with or without sulphate of lime. You may prepare your oxide of iron with muriate of lime, but I do not use them together." I really do not think you can make a nonsuit out of Laming's patent.

Baron WATSON: Your argument goes very strongly to show that there is a colourable imitation; but all these are matters of observation. What you have to say is, that something patented here is part of Laming's patent.

Baron BRAMWELL: Mr. Grove, with great boldness, says he meant to evade Laming's.

Mr. GROVE: And I say that he had a right to do so.

Mr. BOVILL: Perhaps it might be more for the jury; but it is a remarkable fact that where Laming says he uses gas liquor, the other says he uses the hydro-sulphuret of ammonia.

Baron BRAMWELL: He changes gas liquor into hydro-sulphuret of ammonia, and muriate of iron into sulphate of iron.

The LORD CHIEF BARON: We cannot nonsuit upon that.

Mr. BOVILL: There is another matter which I approach with great difficulty after the observations of the learned baron who tried the case. I refer to the carbonate of iron.

Baron BRAMWELL: I report to the court that you gave it up, and I will give the most convincing proof in the world, if wanted by the court. Laming describes a process, and he says, "I get a carbonate from it." Upon which you say, "That carbonate means oxide; therefore he claims an oxide." In the first place, I do not think it ever was construed to mean oxide; but supposing it was, he describes the process, and he shows what the result does, and it matters not whether he calls it an oxide or a carbonate any more than if he called it a fiddlestick. You ought not to press that.

Mr. BOVILL said he would not press it, but perhaps he might be permitted to say that really and truly this carbonate of iron described by Laming was strictly, if exposed to the air at all, a hydrated oxide of iron. It was a most remarkable thing that in practice a pure carbonate was not to be had; it could not be procured except under an air-pump.

Baron BRAMWELL: You may prepare it under water.

Mr. BOVILL said, if kept hermetically sealed from the air, it might be; but so soon as the air got to it, it had this peculiarity, that the carbonate took up the hydrogen of the air, and it became hydrated oxide of iron. Laming described how to procure this material, and it was a curious thing that he then said he mixed it with sawdust, in doing which it would become hydrated oxide; so that it was a mere difference of terms.

Baron BRAMWELL: That does not and cannot go to a nonsuit. There was a great controversy upon it, and it was said that, though that was true of a small parcel, where each part became exposed to the air, it was not true of a large one.

Baron WATSON said it was not surprising to him that the jury should have given a verdict which was not satisfactory, for his own mind had got rather confused with it.

Baron MARTIN: How could a jury understand it?

Baron BRAMWELL said he was not in the habit of complimenting juries as though they knew better than himself, because he did not believe they did, but he did not like to say that this jury was in the wrong. (To Mr. Bovill:) There were several cogent things against you in the evidence; but that is to come.

Baron MARTIN said, looking at the report of the evidence, he had been strongly impressed with the view that the defendants' case was the strongest one.

Mr. BOVILL said he was sure the plaintiff and his counsel thought the verdict would be against them. He submitted that, on the grounds he had urged, the defendants were entitled to have the nonsuit entered as matter of law on these two patents.

Mr. LUSH said the question here was, not whether Croll's patent was good, but what information did Croll, by his patent, give to the world—that was, to that portion of the public supposed to understand these matters—in the year 1840. If he communicated what Hills patented in 1849, of course the latter could not maintain his patent. He would just suppose for a moment that Croll's patent had been put in in support of the plaintiff's case. If this had been done, it would have appeared that Croll had said: "You may purify gas from sulphuretted hydrogen by the application of the oxides of iron." It would be known by the evidence which the plaintiff himself put forward that at that time there were two descriptions of oxide of iron—hydrated and anhydrous; and it would be known that persons acquainted with the subject at that time would have used the hydrated if they wished to carry out his invention. The question was, not what Croll claimed, but what he proclaimed. He had told the public in terms that they might purify gas with oxides of iron; and persons acquainted with these subjects would have taken that which it was known would absorb sulphuretted hydrogen. None of the witnesses suggested that they should have tried the native oxides; they were quite the exceptions.

Mr. GROVE said there was more iron ore in one hill in Merthyr than there was iron rust in all Europe.

Mr. LUSH submitted that the judge, having all these facts before him, would have said to the plaintiff—"There is no evidence to go to the jury that your patent is a novelty."

Baron BRAMWELL: Or, better than that, it would have been more correct to say—"There is evidence to go to the jury that your patent is not new, The undisputed fact is, that Croll's patent is produced and proved, and my construction is that it means hydrated and anhydrous oxides."

Mr. LUSH: Those who understood it at the time would know that.

Baron BRAMWELL: It strikes me that you have very clearly and concisely answered the Attorney-General's argument—but not so Mr. Grove. The proposition assumes that all hydrates are meant; all hydrates will not do, and it becomes matter of experiment which. The judge cannot therefore construe the document, and must leave it to the jury to say whether it was so certain that any man reading the specification would use the hydrated oxide.

Mr. LUSH was assuming his lordship to act upon the evidence before him,

and that was not the evidence. [The learned counsel read extracts from the evidence of Mr. Campbell and Professor Miller, and contended that neither of these gentlemen proved that the native hydrated oxide would not purify.]

Baron WATSON: Is it your opinion that a judge can act upon uncontradicted evidence?

Mr. LUSH: Yes, my lord.

Baron MARTIN: Putting the two papers together, without any further knowledge upon the matter, it would appear upon the authority of *Bush and Fox* that that is right; but if it does not appear upon the face of the document, you must have evidence upon the subject.

Mr. LUSH: Surely it is for the judge to say, at the close of the plaintiff's case, there is nothing to go to the jury?

Baron MARTIN: Clearly so.

Baron BRAMWELL: If at the time of Croll's patent it had been said that a person would have tried artificial hydrated oxide of iron and no other, it would be for me to say so.

Baron MARTIN: Not if the counsel is merely silenced.

Baron BRAMWELL: You need not go into that, because no party said that they would try anything else.

Mr. LUSH: But we are going upon the plaintiff's evidence, and it was said by them that such was the state of knowledge at the time.

Baron WATSON: And that must go as a matter of fact to the jury.

Mr. LUSH: The plaintiff could not say to the jury—"Do not believe these witnesses." My conviction is that his own witnesses proved that his own patent was not new.

Baron WATSON: I have no doubt that the judge would say, your own witnesses have proved it; but then all he could do would be to leave it to the jury.

MONDAY, JUNE 13.

Mr. LUSH resumed his argument this morning. Having on Saturday said all that occurred to him upon Croll's patent with reference to the nonsuit, he proceeded to-day to the patent of Laming, confining himself as he did before to the point of nonsuit. Here again the question was, not what Laming claimed as the subject of his invention, but what he made known to the world. Laming stated in the earlier part of his patent what he used for purifying gas from ammonia; that the chloride of calcium and the oxides which would be precipitated were both useful for the particular process. In page 6 of his original specification, having stated what would purify gas from ammonia—one of the ingredients being the oxides of iron precipitated, which would be hydrated—he went on to tell the public what would be the efficient agent for purifying the gas from sulphuretted hydrogen, and that agent, it would be found, was exactly what Mr. Evans afterwards patented. He said: "Another part of my invention consists in increasing the purifying powers of the aforesaid preparation of chloride of calcium, or chloride of calcium and metallic oxide, or chloride of calcium and metallic carbonate, and also of the aforesaid metallic salts absorbed in solution into sawdust, by adding thereto (among other things) oxide of iron obtained in a proper state from any other economical source." He had already stated one source from which oxide of iron might be obtained; that would be the hydrated oxide. He said: "If you want to increase the purifying power, I have told you first of all what will purify it from ammonia. Now, if you want to increase that purifying power, add thereto oxide of iron obtained in a proper state from any other economical source. I have told you one source which will produce the hydrated oxide. You may obtain it in a proper state from any other economical source; if you want to increase the purifying power, that is the agent that will do it."

The LORD CHIEF BARON: You are taking this from Hills' patent.

Mr. LUSH said, No; he was taking it from Laming's. "And then the oxide which I prefer is one or other of the oxides of manganese prepared from the carbonate of that metal by a process of which I claim the practical application. * * * I do not claim the exclusive use of any metallic oxide for purifying coal gas." This, it was quite evident from the specification, was an evasion of Croll. He had seen that Croll claimed the exclusive use of metallic oxide, and therefore he said, "I do not claim the exclusive use of any metallic oxide, but what I do claim is the combination for that purpose of all the oxides, among the rest oxide of iron, with the other purifying matters above indicated, whereby the gas may be perfectly purified from its ammonia and its hydro-sulphuric acid without requiring a succession of purifying vessels." It was enough for his purpose that both these patents proclaimed to the public, before Hills' patent, that hydrated oxide of iron was a purifying agent. It was not necessary to confine it to one or the other. It would be seen that Croll had told the world that oxides of iron would purify gas from sulphuretted hydrogen. Laming said—and one could not help seeing in order to evade the other patent—"I will tell you, first of all, I am going to purify gas. First, I shall purify it from ammonia. How shall I do it? By using chloride of calcium. I precipitate from the oxide of iron, which is hydrated oxide, a residuum which will purify the gas from ammonia. But that is not enough; I want to purify it from sulphuretted hydrogen, and now I will tell you how you may do that. Add to what I have already stated the oxides of iron obtained in a proper state from any other economical source." Now, he did not say all the oxides of iron, but the oxide of iron, which you may obtain in a proper state for effecting this process; then calling in aid what the chemist had said, they knew that this was oxide of iron. Laming had already stated in the earlier part of his specification the mode by which oxide of iron might be obtained, and he stated that that was the agent that would purify from both matters.

Mr. GROVE: With chloride of calcium.

Baron WATSON observed that Laming did not make that his patent. It did not appear from the specification that chloride of calcium alone would do it.

Mr. LUSH admitted that it did not in terms say so, but it did in effect. It did not matter what he claimed, but what he told the world.

Baron WATSON: If you read that, it would not appear that chloride of calcium would alone be sufficient for purifying gas.

Mr. LUSH admitted that it was so. But, as he had already said, if you wanted to purify from ammonia, the chloride of calcium would do; but if you wanted to purify the gas from sulphuretted hydrogen, which was the subject of Hills' patent, then you must add the oxides of iron. This was fairly telling the world that the agent for purifying gas from sulphuretted hydrogen was oxides of iron—not anything else in combination with it, but that agent alone, mixed with sawdust. But that this was the object was clear from the latter part of the specification—"What I do claim is the combination for that purpose of the oxide of iron with the other purifying matters above indicated, whereby the gas may be perfectly purified from its ammonia and its hydro-sulphuric acid without regaining a succession of purifying vessels."

Baron WATSON said it appeared to him that this must be a matter of evidence.

Mr. LUSH thought not at this particular point. They found the same terms used by Hills—oxide of iron—the same term used by Croll, and the same term used by Laming. Therefore on this point he apprehended they did not want to recur to the evidence, because Laming said in terms that the agent for purifying gas from sulphuretted hydrogen was oxide of iron obtained in a proper state from any economical source—which was the hydrated oxide?

Baron MARTIN thought from the specification that Laming fancied that from Croll's specification oxide of iron would accomplish it.

Mr. LUSH said, Yes; this was why he repudiated the claim of the exclusive use of oxides of iron alone, because he thought Croll's specification embraced that.

Baron BRAMWELL asked Mr. Lush to show him where it was stated that chloride of calcium was a purifier from the ammonia only.

Mr. LUSH said it would be found in the 4th page of the specification, commencing line 30. [The learned counsel then read that part of the specification commencing, "Another part of my evidence," down to "purification of coal gas."] He added, the specification did not state in terms that chloride of calcium was used for purification from ammonia, but the fact might fairly be collected from the other section which he had read. Therefore, if they wanted to increase the purifying power, what was the agent to be used? Oxides of iron. What would be the effect of using that agent? To purify it not only from ammonia, but also from its hydro-sulphuric acid.

The LORD CHIEF BARON: How can anybody say that? As Mr. Hindmarch very correctly said, not only could no one tell that, but it was a positive fact that when acting separately the chloride of calcium acted better in one sense—it was not liable to have its action impeded by frost.

Mr. LUSH thought it enough to say, "If you want to increase the purifying power you will add nothing more but the oxides," which showed that the oxide was the purifying power. Let any chemist read this specification in connexion with Croll's specification, and he could not fail to get to the knowledge that the agent for purifying gas from sulphuretted hydrogen was the oxide of iron—and hydrated oxide of iron, because the specification told you how to prepare it. These were the observations he had to offer on Laming's patent; he submitted that the case was stronger upon that than it was upon Croll's patent, and, taking the two together, what they proclaimed to the scientific world, he submitted that no person with a competent knowledge of chemistry could read them without coming to the knowledge of that which Mr. Hills afterwards took out his patent for—that the agent for purifying was the oxides of iron so obtained as to be hydrated oxide of iron.

Mr. WEBSTER, on the same side, said he would trouble their lordships with a few observations on the point as to how far a material part of that which was described and claimed in Hills' specification was not anticipated both by Croll and Laming. One test, he apprehended, applicable to a case of this kind was this: whether, looking to the prior specification—for instance, Croll's specification—and then looking to what was described in Hills', and then doing what was there described, would not be an infringement upon Croll's specification. If that were so, then there was a second grant of something which was the subject of a prior grant. Upon that test the second grant was clearly invalid; because, without going into cases, there could not be a grant for the whole or a part of anything which had been made the subject of a prior grant. That disposes at once of anything that might be alleged as to the necessity of any questions of user, because he did not think it necessary in support of this case to refer to what Croll himself did, except so far as showing what was the meaning of the terms employed in his specification. Now, the specification of Croll, so far as regarded its object and purposes, was precisely the same as the specification of Hills; they were both for the purification of gas, and depriving it of the same impurities by means of using similar substances. Mr. Croll's specification had these words:—"That the same effect may be reproduced by the application of the oxide of zinc and the oxide of iron, and treated precisely in the same way as above described." Assuming that there had been no subsequent patent, would not a person practising the purification of gas by means of any of the oxides of iron have infringed Croll's patent? It was not necessary to say that there might have been some insufficient or imperfect description in Croll's patent: that was not the test. The question was, whether there was a declaration to the world that a certain class of substances would answer the purpose. The suggestion that the test of the sufficiency of the specification, or the validity of the patent with respect to the specification, was important in this case, was founded, so to speak, on a disregard as to what was the condition with respect to which the specification was required. The party was to describe the nature of his invention, and in the manner it was to be performed. Now, could any one say that Mr. Croll had not disclosed to the world that oxides of iron were to be used, and could be used, beneficially for the purification of gas? That was the whole scope and object of his patent, so far as regarded that part of it. He announced to the world as an improvement in the manufacture of gas oxides of iron, which were to be obtained and dealt with according to a process previously described—according to a process which, when read by the assistance of the chemical evidence as to what was the meaning of the terms then understood, was, in point of fact, this very hydrated oxide of iron. A good deal had been said as to what might be considered the question for the court and the question for the jury on the construction of these instruments. It struck him that nothing that altered the rule which was laid down by the case of *Neilson v. Hertford*, where the Court of Exchequer, after a great deal of argument, of many days' duration, directed pretty much as to whether the meaning of the word "effect" was a question for the court or a question for the jury, said the court must deal with the specification, a written instrument, in the same manner that it dealt with every other instrument, and when there was no doubt as to the meaning of the terms of art, having ascertained by the evidence of witnesses the meaning of these terms, then it was for the court to interpret this specification. Now, applying this test to this instrument here, they had the use of the word "oxide of iron," which, as it now appeared, might relate to the two classes, the anhydrous and the hydrated oxide. Both would answer. At all events this was quite clear, that what Mr. Croll did, the oxide that he employed did answer for purifying the gas to a considerable extent, which was sent out in the usual way of commerce. Now, if that were the proper rule that the court should ascertain the meaning of the terms of art—the meaning of the terms employed in the specification by the evidence of scientific witnesses, could their lordships, looking at this specification, and then looking at Hills' specification, come to any other conclusion than this, that supposing he had used hydrated oxide immediately after Croll's patent, he would have infringed Croll's patent. Then if that were so, if Hills claimed hydrated oxide, he claimed something that had already been made the subject of a prior grant.

Baron MARTIN: You are assuming entirely that Croll's patent is a good patent.

Mr. WEBSTER said he was not assuming that entirely. There were two questions. Croll's patent might have been a bad patent, by reason of its being an imperfect description in some respects; but what he was putting to the court was this, that the nature of Croll's invention was clearly the use of

oxides of iron. Hills' might have been a better mode, but if they looked to Hills' patent, his claim was as general as possibly could be, for at page 7, line 11, where Hills summed up his claims, he said: "For the purifying coal gas from sulphuretted hydrogen, I use the precipitated or hydrated oxide of iron, or the sub-sulphates or oxychlorides of iron, from whatever source obtained, either by themselves, or, which is much better, made into a more porous material by being absorbed into or mixed with sawdust." So that in Hills' patent the claim was, the use of precipitated or hydrated oxides of iron from whatever source obtained by themselves. Now, was not that a claim of something that Croll had previously claimed? He would come immediately to the question Mr. Baron Martin had put. But at present, assuming that Croll's was a good patent, Hills had here made a distinct claim to the use of these substances either by themselves or for any other purpose; therefore there was in his specification a distinct claim to the use of something which was described and claimed in Croll's specification; that necessarily invalidated the subsequent patent. Then the decision of a case which was affirmed in the Exchequer Chamber, *Thomas v. Foxwell*——

Baron WATSON: What was the patent for in that case?

Mr. WEBSTER: The patent was for a sewing-machine to work a needle. The invention consisted of a peculiar arrangement whereby the shuttle or needle was made to traverse in a certain manner, so that it performs substantially sewing done by hand.

The LORD CHIEF BARON: It is weaving with one woof; it is not sewing at all. That is what the sewing-machine is. But what was the point in that case?

Mr. WEBSTER said the point was this: In that specification there was a distinct claim to a needle in combination with a shuttle. It appeared that there had been, in a prior specification, the claim of a needle and the shuttle; and the court held as that was a claim which was in terms covered by the claim obtained in a previous specification, quite without reference to the success of the invention in either case, that the patent was invalid.

The LORD CHIEF BARON: Where was the cause tried?

Mr. WEBSTER: In the Court of Queen's Bench, before Lord Campbell.

The LORD CHIEF BARON: Was the judgment affirmed?

Mr. WEBSTER: The judgment was affirmed.

The LORD CHIEF BARON: The judgment of both courts was that the patent was bad.

Mr. WEBSTER: It was bad by reason of there being a claim to something which was covered by the claim of a prior patent. It was a contention analagous to the contention in this case, that the general description in the preceding patent must not be held to invalidate a subsequent patent because the subsequent patent was confined to the particular claim.

The LORD CHIEF BARON would observe, with respect to that patent, and the prior one, which was deemed to render this invalid, that they were matters really capable of being seen and appreciated by inspection. The courts at one time were supposed to be capable, by inspection, of telling whether a person was twenty-one years of age or not. That would be a difficult task to perform; but he thought there could be no difficulty when you saw an operation actually performed before you, and when there was a description with drawings, such as were to be found in the case of *Thomas v. Foxwell* and the prior case. A case of chemistry was undoubtedly different; it was not so capable of appreciation. The present chemical instance was certainly of a nature that the court could not see and judge and decide whether there was identity between them.

Mr. WEBSTER said he was only referring to that case, and also to the case of *Brooke and Aston* which was also in the Exchequer Chamber, with a view to lay the foundation of the principle of his argument, that the court would take these instruments and look at them; and if they saw there was a claim in the subsequent instrument which was substantially claimed or described, it was not necessary that it should be claimed, but that there was a claim to something which was contained in a prior instrument, so that the practice of that would be an infringement of that prior grant, that they would invalidate the patent. Now this was one test of law which he would respectfully submit ought to apply to this case—Assuming that a person had practised Croll's invention, or had used any oxides of iron for purifying gas immediately after the date of the patent, would he not have infringed Croll's patent, without reference to Croll's being a valid patent? There might have been some imperfection as regarded the description not being the best within Croll's knowledge, or some other description with respect to which the patent might have been invalid; at the same time it was a sufficient publication to impeach the subsequent patent. If the court applied that test of Croll's being a statement so far as regarded the nature of the invention of the use of the oxide of iron, and then referred to Hills' specification where he spoke of "precipitated or hydrated oxides, which are to be used from whatever source obtained, either by themselves, or, which is much better, when mixed with other substances," then the court would see that it was impossible for any person to read these two specifications side by side without coming to the conclusion that Hills in his specification had claimed something which was anticipated in Croll's specification. It might be that Hills had a perfectly good patent if he had limited his claim to the use of oxides of iron in combination with those other substances, or in the manner claimed. But that was not his claim—the court had only to compare the two instruments to see that there was in the subsequent patent a claim to that substance which was made the subject of the claim in Croll's patent. On this ground he submitted that Hills was not the first inventor, and that Croll was the first inventor, and that the practice of Hills would have been an infringement of Croll's patent, or any other person who practised it without a license. He would not trouble their lordships with any lengthened observations on the subsequent patent of Laming. He thought that a comparison of those two specifications—Hills' specification and Laming's specification—having had the terms of art explained by scientific witnesses, would show that Laming's specification went to the use of the very substance and for the same purpose that was claimed in the subsequent specification of Hills; therefore, that again rested on the same principle. Assuming this patent of Hills to be a good patent, neither Croll nor Laming could practise the invention which he contended they had published to the world previously, and that was wholly independent of whether Laming's or Hills' might have been a good patent or not. The patent might have been entirely with respect to other matter. A patentee like Hills was bound to describe the nature of his invention and the manner the same was to be performed, limiting it to that which was altogether new. It might be a perfectly good patent, if limited to the use of certain substances in combination; but it was not so limited. The claim was of a very wide nature—sufficiently wide to include matters answering the facts disclosed to the world by Croll and Laming. Then it had been said, you could not look at the specification or look to what was done by Croll; but he apprehended that what was done by Croll was conclusive evidence that his invention answered as to what he meant. Then they had the further explanation of the use of the terms of art. Mr. King, of Liverpool, showed distinctly that he used the same substances. It was not so much question of these oxides of iron being anhydrous or hydrated, but the question was as to their molecular constitution, whereby these gases were acted upon. Therefore he submitted that in a material part which Hills had claimed he was anticipated both by Croll and Laming, and that the specification was too large. He claimed to be the inventor of more than he was really authorized to claim, and on that ground he submitted the court ought to nonsuit the plaintiff.

Mr. DENMAN, on the same side, said the observations he intended to make, both with regard to Croll's and Laming's patents, had been in substance anticipated by Mr. Webster and Mr. Lush. They had, in substance, put the very arguments he was about to use—that the claim of Hills was not a new invention. He thought it his duty to call the attention of the court to the plaintiff's claim. There had been two assumptions made by the other side, which were not in effect warranted by the real terms of Hills' specification. His learned friend the Attorney-General had assumed, and certainly not proved, that when Hills in his specification spoke of precipitated or hydrated oxides, that he meant only those hydrated oxides which were precipitated. He apprehended that when the court looked at the terms of Hills' specification they would be clearly of opinion that it was not so, but that, when he spoke of hydrated or precipitated oxides he meant hydrated oxides which were not precipitated as well as hydrated oxides which were precipitated. The plaintiff mentioned them several times in the course of his specification. The first occasion on which he mentioned them he used this language:—"I take the sub-sulphates, the oxychlorides, or the hydrated or precipitated oxides of iron, which I prefer to use in a rather damp state, either by themselves," and so on. On the second occasion when he mentioned them, he said—"Hydrated or precipitated oxides of iron may be conveniently prepared for this purpose." He did not say that you must use hydrated oxides of iron which were not prepared at all, but which were found in a native state. And what confirmed the view he was now submitting to the court was, that on the third occasion on which he mentioned what he used he said—"I purify the coal gas from sulphuretted hydrogen, cyanogen, and more or less from ammonia, by passing it"—not through hydrated or precipitated oxides of iron, but—"through precipitated or hydrated oxides." He changed the collocation of the words, and did not put the terms in such a shape as he did before, which gave rise to the argument of the Attorney-General. He first used "hydrated or precipitated" twice, and then used "precipitated or hydrated." He used these words after the word hydrated, "from whatever source obtained." Now, his friend wished to limit that to some source which limited it to precipitation alone. Suppose Mr. Hills had used an hydrated oxide which was not precipitated, and supposing there had been no other objection to his patent at all—suppose there had been no question between him and any other patent—would he not have claimed by the use of a natural, a native hydrated oxide of iron for the purification of coal gas, that that was an infringement of his patent?

Baron BRAMWELL: Is not this a question of grammar, or of the construction of the English language?

Mr. DENMAN thought so.

Baron BRAMWELL: As I understand your argument, it is this—that he does not mean hydrated or precipitated in the sense in which a thing is both, but that he means hydrated as one thing and precipitated as another. That certainly is not so.

Mr. DENMAN: If there are two different sorts, one precipitated and the other not, I say Mr. Hills claims both by this specification.

The LORD CHIEF BARON: But the precipitated will always be applicable to the purpose. The mere hydrated—the natural hydrated—is its natural state.

Mr. DENMAN said it did happen that there were some hydrated which would not precipitate, and Mr. Hills had no right to say he did not mean those hydrated which would not, but he had a right to say that Croll in his specification meant those which would not.

Baron BRAMWELL: You read it as alternative—"hydrated" *or* "something else," that is "precipitated." They read it "hydrated," that is "precipitated." It appears to me that your reading is an impossibility, because your reading would make it, "hydrated, or what is not hydrated—that is, precipitated." All precipitated oxide is hydrated: all hydrated is not precipitated.

Mr. DENMAN said he was now referring to the passage in which Hills did not say "hydrated or precipitated," but "precipitated or hydrated, from whatever source obtained."

Baron BRAMWELL: That seems, to my mind, to make rather a better case to show that they are convertible terms.

Mr. DENMAN certainly did not read them so. He apprehended Mr. Hills would have been very much surprised, supposing there were no patent at all in conflict with his own, if somebody else had used a native hydrated oxide, and had said, "I don't infringe your patent, because you say 'precipitated or hydrated, from whatever source obtained.'"

Mr. GROVES, interposing, said it was right the court should know there was another point to be argued which dealt with this objection, and at present they had all abstained from arguing it. There were a vast number of things yet to be taken into consideration which might assist in ascertaining the meaning of hydrated or precipitated.

Mr. DENMAN did not propose at present to argue another point, but he thought it was important, with reference to what Croll and Laming had anticipated, to see what was the real meaning of the words used by Hills. What his friend relied upon, as showing especially that hydrated or precipitated mean the same thing, was that passage which began "hydrated or precipitated oxides of iron may be conveniently prepared for this purpose by decomposing," and so forth. Now, that passage did not certainly say that none but precipitated oxides were to be used, but that those hydrated oxides which were precipitated might be conveniently prepared for the purpose. That was all that passage said. The former passage was nothing at all to the point, except that there it used the words "hydrated or precipitated" instead of what it used afterwards in the claim—"precipitated or hydrated." The fair result of that was in favour of Mr. Hills, if he were claiming in his patent the use of all oxides of iron for the purification of coal gas "from whatever source obtained." There was another point with reference to what Mr. Hills claimed. He thought he was warranted in saying that the substance of his claim was like the substance of Laming's claim; not simply the purification of coal gas from sulphuretted hydrogen by the use of hydrated oxide of iron, but the purification of coal gas from ammonia by one substance, and from sulphuretted hydrogen by another substance. It was a total act of purification, partly from ammonia, and partly from sulphuretted hydrogen; not confining his claim to the purification from sulphuretted hydrogen alone. Because in his claim he said: "First, the purification of coal gas from sulphuretted hydrogen, cyanogen, and more or less perfectly from ammonia, by passing it through precipitated or hydrated oxides of iron or the sub-sulphates, from whatever source obtained, either by themselves or, which is much better, made into a porous material," and so forth—"either used alone, or mixed with sulphate of lime, or sulphate or muriate of manganese, potash, or soda; either used alone, or in combination with other purifying materials, at present used for a similar purpose." Now, what was the purpose? The

purpose was to purify the gas from sulphuretted hydrogen and ammonia at the same time, by the use of oxides of iron in combination with other things. That was the substance of the claim; but in Laming's case also the substance was a claim for the purification of gas by one process from sulphuretted hydrogen and also from ammonia. Then he went on—and it was well to call attention to that at once—"I do not claim peroxides of iron and manganese made at a red heat, &c." Now, his friends had used that very ingeniously to this effect, to show that Laming and Croll could not have anticipated Hills, because Hills expressly disclaimed some things which Croll and Laming had not claimed. It was not necessary to contend that Croll or Laming should really, in so many words, claim as their invention, for which they had taken out a patent, the thing which they had published to the world by their specification before Hills published his specification. It was quite sufficient that they had proclaimed it so as to make it known to the world, even though at the time they proclaimed it they disclaimed it, and so did not claim it. It was not a question whether Croll or Laming claimed it, but it was a question whether, on the face of their patents, they did make it known to the world. Therefore it did not follow, because Hills disclaimed some things which they had made known to the world, that he had a right to take other things because he disclaimed some combinations of Croll and Laming. He submitted that this disclaiming part at the end of Hills' specification showed that he misunderstood Croll, and that he intended, by taking one of a great many combinations, to invade and evade Laming. He had no right to do that. Then he said: "I do not claim peroxides of iron and manganese made at a red heat," &c. He did not, in fact, disclaim Croll, because Croll did not claim at a red heat. Having made these observations upon the plaintiff's specification, he would make a very few upon Croll. There was one point which the Attorney-General laid great stress upon. Now, he thought they might assume thus much in dealing with Croll's specification: that all oxides of iron were either hydrated or anhydrous. There was no dispute upon that. But he thought he might just mention to the court that the hydrated oxide was just as natural a substance in fact, and a more natural substance, than anhydrous; because, while you could convert hydrated into anhydrous by the application of heat, you could not convert anhydrous into hydrated by merely adding water to it. They were a chemical combination together, and not a matter of mechanical mixture. Besides, he thought it proper the court should be set right upon the point that the Attorney-General laid stress upon. He said that the passage in Croll, page 4, line 15, showed that it was both oxides of iron that were meant by Croll. He, on the contrary, said it meant those which purified from sulphuretted hydrogen; whereas the Attorney-General said it meant the other, because where Croll used oxide of zinc he employed the singular, and where he used the oxides of iron he employed the plural. About this there was no dispute whatever. The black oxide of manganese, which he did use in the singular, was protoxide as well as peroxide. The black oxide of manganese might be hydrated or anhydrous, yet that was used in the singular number. How, then, did the use of oxides in the plural number show both hydrated and anhydrous? The analogy was drawn from another case, which furnished analogy the other way—in their favour, and not in favour of the other construction. The other side said oxide of zinc was used in the singular number. Why was that? Because, they said, there was not a hydrated and an anhydrous oxide of zinc; therefore they said oxide is necessarily both oxides. Now, there was an anhydrous and a hydrated oxide of zinc, but there was not a protoxide and a peroxide of zinc. That was the reason why zinc was used in the singular number. Therefore that argument amounted to nothing, or, if it amounted to anything, it was an argument the other way. Protoxide became peroxide by mere exposure to the air, and, by mixing it in the way in which all these patents required it to be mixed, it would immediately become peroxide. That being so, he would merely repeat what Mr. Webster had said, that Croll in practice claimed oxides of iron; and under that term he either claimed such oxides as would purify from sulphuretted hydrogen, as were then known to be hydrated oxides of iron, or he claimed both. He said that two things would do it, but that one would do it better than the other. Did it, then, lie in the power of any subsequent inventor to take one of these two divisions and say, "I will tell you—one will do it." Assuming that the plaintiff's patent was simply a patent taken out for the use of hydrated oxides of iron, could he take half of the oxide of iron in nature, and say, "I will take out a patent for that," when Croll had already told them to take the oxides of iron for the purpose of purifying from sulphuretted hydrogen? It was known at the time that sulphuretted hydrogen would be purified by hydrated oxide of iron. Without importing any knowledge into the case at all, he said this, that anhydrous and hydrated both being claimed by Croll, and both being proclaimed by Croll, and both made known to the world by Croll, it did not lie in the power of the plaintiff to say, "I will take out a patent for one of these." He did not even say this, that anhydrous would not do, and therefore "I take out a patent for the other"—the knowledge proclaimed before being too general. He did not do that, but he simply chose out of the two, and he said, "I take out a patent for that." Now, he maintained that the plaintiff could not do that. Then, to proceed to Laming's patent, what was it that Laming claimed? Laming, like the plaintiff, claimed a patent for the purpose of purifying from ammonia and sulphuretted hydrogen; and it was allowed on all hands that the chloride of calcium which Laming claimed was the agent for purification from the ammonia, and not from the sulphuretted hydrogen. Laming having taken out a patent for purifying gas completely from both these impurities, from ammonia and from sulphuretted hydrogen, did it lie in the power of the plaintiff to take out a patent for the purification from sulphuretted hydrogen by the same means that Laming claimed? or did it lie in his power to take out a patent for purifying gas from both these two things by a further combination—by purifying from sulphuretted hydrogen by the same means that Laming used, and from ammonia by something else? He apprehended it was not in the plaintiff's power, and that Laming had anticipated him here, and that the plaintiff's patent was a bad patent on the ground that Laming had previously published the same thing. Upon this point it was important to see what Laming claimed. His friend Mr. Lush had gone into that very fully. It was admitted on all hands that the purification of coal gas by chloride of calcium was a purification from ammonia. Then Laming went on to give particulars of how that was to be done, and he claimed certain salts; and then he went on with this passage, "Chloride of calcium is both abundant and cheap, and under certain circumstances it may be desirable to make it for the purpose of gas purifying by means of lime or chalk; and in such cases the oxides or carbonates which result are useful for purification and need not be removed." Now, that part of the preparation of chloride of calcium was identical with the part of the plaintiff's patent which described his mode of obtaining the hydrated or precipitated oxides. Therefore the result was in truth precisely the same thing which the plaintiff got by the only specific mode which he gave by patenting his mixture, which, though he only claimed it for the purpose of purifying from sulphuretted hydrogen, did purify from ammonia as well. And he went on to say—"In such cases the oxides or carbonates which result are useful for purification and need not be removed." After all, this was telling the world that the hydrated oxide of iron which would result from the mixture was useful for the said purification. Now, what was the said purification? The purification of coal gas from both its impurities—namely, from ammonia by means of the chloride of calcium, and from sulphuretted hydrogen by means of the hydrated oxide of iron. It was that combination of purification which the plaintiff claimed, and which Laming himself claimed. Then he said, "I do not claim"—he did not say it was not proclaimed or told to the world—"I do not claim any of these processes, but I claim the application of mixtures so made to the purification of coal gas." What did the plaintiff claim? He claimed the application of mixtures for the purification of coal gas, and so far as the sulphuretted hydrogen was concerned, he claimed the very same thing—namely, the use of oxides of iron. He would not dwell upon that part which called the substance a carbonate, though he could not help thinking that something hereafter might turn upon that if the case should go to trial again. But he thought they might assume for the present purpose that the carbonate of iron, though described under terms which would produce hydrated protoxides of iron when it came to be used, had nothing to do with Laming's patent. Then Laming went on to say—"Another part of my invention consists in increasing the purifying powers of the chloride of calcium, &c., obtained in a proper state from any other economical source." Why, what was that? From any other source by precipitates from nature, hydrated oxide in nature, any oxide in nature, or any hydrated oxide precipitated or procured from any economical source. Laming claimed to use that, and what did he claim it for? It was perfectly certain, from the latter part of this sentence, that he claimed that metallic oxide solely for the purpose of purifying from sulphuretted hydrogen, because he said, "I do not claim the exclusive use of any metallic oxide for purifying coal gas,"—he did not do that, because he thought that Croll had accomplished that before,—"the exclusive use of hydrated oxide for purifying coal gas, but what I do claim is a combination for that purpose of the oxide of iron with the other purifying matters above indicated, whereby the gas may be perfectly purified from its ammonia and its hydro-sulphuric acid." Now, the court were aware that hydro-sulphuric acid was only another word for sulphuretted hydrogen. And then he accomplished this "without requiring a succession of purifying vessels." Now, could the plaintiff after this say, "I claim two things—I claim first to purify from ammonia by something which Laming uses, but does not use in combination; and I also claim to use hydrated peroxide of iron for purifying from sulphuretted hydrogen." Could he have split Laming's claim up and said, "I claim it separately in two different ways, but I do not claim it in combination?" He apprehended that that would be contrary to all the principles of the patent law, and that there was no case which would enable the plaintiff to do anything of the kind. Further than that, could the plaintiff claim a further combination? Could he take hydrated peroxide of iron, which would still do the work, admittedly the only work, of purifying from sulphuretted hydrogen, could he take that and mix it with any other imaginable substance—whether or not mentioned by Laming or Croll—to purify from ammonia? He apprehended that the plaintiff could not do that. There was a case precisely in point which it was important for the court to take into consideration—the case of *Bovill and Keyworth*, in the seventh Ellis and Blackburn, page 725.

The LORD CHIEF BARON: What was it about?

Mr. DENMAN said it was a patent about grinding corn, and the case was precisely similar to this. In Laming's patent, Laming said he did not claim—(he did not say he did not proclaim it)—he did not claim the exclusive use of any metallic oxide; but what he did claim was the combination, for the purpose, of oxide of iron with other purifying matters. Now, what he wished to call attention to was that he clearly did not mean a chemical combination, but a mechanical combination and mixture; which merely meant a mixture of this hydrated peroxide of iron with other purifying matters—the hydrated oxide of iron for the purpose of taking out the sulphuretted hydrogen, and the others for taking out the ammonia. No one would say that this was a chemical combination, but a mechanical combination; therefore the case was exactly on all fours with the case of *Bovill and Keyworth*. In that case it had been known before that you might improve the operation of grinding corn by injecting a blast of air down the centre of the eye of the stone, and send it out from the grinding surface, and that that would expedite the cooling, and so increase the operation of grinding. It had also been found by a subsequent inventor that the same effect might, to a certain extent, be produced by exhausting the air instead of injecting it through the stones. But it had never been found by any previous inventor that the combination of a blast and an exhaust would greatly facilitate and improve the operation. The patent that Mr. Bovill took out, one part of it was for the combination of a blast and an exhaust, and he complained that the defendant had infringed his patent by the use of the blast and the exhaust combined. There were drawings set out with the specification, and in these drawings the lower stone was invariably shown to rotate instead of the upper stone of the mill. There was supposed to be some great improvement in that, and he afterwards took out a patent for it. He afterwards disclaimed it, and in the mill in which the operation had been used by the defendant he had used it without the lower rotating stone, with the old-fashioned upper rotating stone. The jury found in favour of the plaintiff. There was a motion for a new trial, which was set aside, and ultimately everything turned on the construction of the specification. And the case was afterwards decided in the Court of Queen's Bench, and what the court decided was very much in point. The present case was precisely analogous. Laming took out his patent for the purification of gas from ammonia and sulphuretted hydrogen by a combination of hydrated oxide of iron with something else.

Baron WATSON: There may be an infringement by using either the whole or part; that is the case of *Lister and Leather*.

Mr. DENMAN said yes, and the present was a case of the same kind. Hills claimed purification from sulphuretted hydrogen and ammonia by two means, which he gave; and Laming claimed purification from sulphuretted hydrogen and ammonia by two means, which he gave.

Baron WATSON: Laming entirely excludes oxides of iron in any part of his invention.

Mr. DENMAN said he had used the word "claimed" improperly; the word proclaimed would do quite as well. He did not claim it because Croll claimed it; and so the court must take Laming's patent plus Croll, and then it was evident to the world that the two were made known before the plaintiff claimed.

Baron BRAMWELL could not help thinking there was a difference between the two cases. Anybody reading *Bovill and Keyworth* would see that the things were capable of being detached from each other; you might have the exhaust and the blast, with the different stones rotating. But could anybody see here, by mere reading, that the hydrated oxide of iron would purify from sulphuretted hydrogen.

Mr. DENMAN thought they could.

Baron BRAMWELL thought Mr. Hindmarch made a very good observation

upon that, that there really was not merely an independent action in the hydrated oxide of iron, but that that independent action, under certain circumstances, was impeded by the presence of chloride of calcium.

Mr. DENMAN said the plaintiff ought to have told the world he claimed the abandonment of chloride of calcium as an improvement. He did not do anything of the kind; he did not claim it as an improvement upon anything that had gone before, and that might make all the difference. What he did claim was the hydrated oxide of iron for purifying from sulphuretted hydrogen. So did Croll. Why, therefore, were they to assume that Laming, who had this knowledge given him by Croll, would use hydrated oxides of iron for doing something which it would not do? He apprehended that, putting Laming and Croll together, the use of metallic oxides in these two specifications was both for the purifying from sulphuretted hydrogen. He thought they might take these two specifications together. They were both documents before the court, and they were not bound to separate them. But they might take them together as clearly proving to the world that the hydrated peroxide of iron was an invention clearly known for that part of the process. Then the plaintiff had taken out an invention for that part of the process, with something else to do with some other part. He was not entitled to do that; he was doing the same as Laming, and Laming had anticipated him. He really apprehended that it did come within the principle of the case he had quoted—the case of *Bovill and Keyworth*. In that case there was some advantage in using the lower rotating stone, which was used incorporated; and the court assumed for the purpose that that was part of the combination, and said—"You cannot take something else; you infringe the patent if you take something else and combine it with the patent." So he said here, that Croll and Laming had invented this combined process.

The LORD CHIEF BARON: Had the lower millstone been made to rotate by anybody else?

Mr. HINDMARCH: Yes.

Mr. DENMAN said that was not material here, because the court in that case assumed that the rotating lower stone was part of the invention.

Baron BRAMWELL could not see clearly how it mattered, because the court came to this conclusion—"If it is part, why then you have infringed a part of the entire combination; if it is not a part, you have infringed the whole combination."

Mr. DENMAN said he took the same view here. He did not care what Laming claimed, but it was what he had told the world.

The LORD CHIEF BARON said, rejecting the word "combination," which might mislead one with reference to Bovill's patent, what the court decided in that case was this:—An exhaust had been used before, a blast had been used before, a lower rotating stone had been used before; he combined all three, and the Court of Queen's Bench held that another person could not take two parts of the combination and use them with a rotating lower stone.

Mr. DENMAN said, then here he submitted that Hills could not take one part of Laming's combination—namely, the metallic oxide for the purifying from sulphuretted hydrogen—and combine it with something else for the purpose of purifying from ammonia. It was precisely the same case. In the case of *Bovill and Keyworth* it was combination and sub-combination; whereas here it was the combination of two simple things for doing two different processes. If Hills had taken something else to purify from ammonia, with the hydrated peroxide to purify from sulphuretted hydrogen, he had, in truth, infringed Laming. It was not necessary to put it in that way; he would put it in that way as the alternative most against himself, because he said that Laming had proclaimed to the world that hydrated oxide of iron would do it. But if he had only proclaimed it to the world that hydrated oxide of iron would do the one and chloride of calcium the other, then he said Hills had done the same thing, and had pirated Laming, and had pirated Croll in claiming that, and in telling the world that it would do what Croll had already proclaimed to the world.

The LORD CHIEF BARON said the court was not in a condition at present to direct a nonsuit or a verdict for the defendant. If the defendants intended to appeal from the ultimate decision of the court upon the whole rule, and take the appeal to the Exchequer Chamber, they were at liberty to do that, and might do it immediately. Perhaps Mr. Bovill would say whether he intended to appeal from the judgment of the court upon the subject of entering a nonsuit or a verdict for the defendant. Perhaps he would like to consider it before taking the argument on the other point.

Mr. BOVILL thought it would be better to consider it.

Baron WATSON thought it right to intimate to Mr. Bovill that his own opinion was that there could not be a nonsuit.

Baron BRAMWELL expressed himself of the same opinion.

Mr. BOVILL said, after this strong expression of opinion, he should prefer the whole matter being disposed of here, without foregoing the right of appeal.

Baron MARTIN: If we made the rule absolute for a new trial?

Mr. BOVILL: Then, I think the probability is we should go down to the new trial rather than appeal. [After consulting with his clients, Mr. Bovill added:] I have spoken to my learned friends who are with me, and I may state at once that, if your lordships grant a new trial, we should go down to the new trial in preference to appealing.

The LORD CHIEF BARON: Very well. Then, Mr. Grove, you had better go on with the argument against the rule for a new trial on the ground that the verdict is against evidence.

Mr. GROVE said he was not then prepared to argue upon the question of facts, and he would ask the court to hear the Attorney-General. His own attention had been directed to the question of law.

Mr. BOVILL said he attached very little value to any contradiction that was given. The essential contradictions were very few. One question was whether Hills was the original inventor. Evans swore he was the inventor. The evidence against him did not consist of contradiction, but consisted of proof, that his brother might have seen the stuff turned out and become red. In all the evidence upon that point there was no contradiction at all. It was one set of evidence on one side, and one set of evidence on the other side. They did not contradict each other.

Mr. GROVE said he had read the evidence as carefully as he could, but his mind had been directed to the points of law, and he did not intend to take any argument in the facts.

The LORD CHIEF BARON: Your application is a reasonable one. When will the Attorney-General be able to attend?

Mr. GROVE thought the Attorney-General would be disposable to-morrow.

Baron MARTIN said the court had arranged to take three revenue cases to-morrow.

Mr. GROVE said there was a great deal of evidence that ought to be somewhat elaborately laid before their lordships, to see the strength of the plaintiff's case in the evidence.

It was finally arranged to adjourn the further argument till the 24th inst.

COURT OF COMMON PLEAS

THURSDAY, JUNE 16.

(*Sittings in Banco, before Lord Chief Justice* COCKBURN, *Justices* WILLIAMS, WILLES, *and* BYLES.)

THE LONDON GASLIGHT COMPANY *v.* THE VESTRY OF THE PARISH OF CHELSEA.

In this case a rule had been obtained against the defendants, calling upon them to allow the plaintiffs to inspect certain books, &c. The plaintiffs had agreed to supply the parish with gas of a certain quality, which the defendants considered they did not get, and in consequence they employed certain parties to test it. Proceedings had taken place in consequence upon the breach of contract, when the plaintiffs applied to inspect the books, documents, &c., connected with the experiments. That was done, but they considered certain papers, &c., had been withheld.

Mr. D. KEENE showed cause against the rule, and referred to affidavits which stated that every document had been examined by the plaintiffs.

After hearing learned counsel in support of the rule,

The Court refused the rule.

Miscellaneous News.

CITY OF LONDON COURT OF SEWERS.

GUILDHALL, TUESDAY, JUNE 7.

OPPOSITION TO THE CITY GAS COMPANY'S BILL.

The Ordinary Weekly Meeting of the Commissioners was held this day—Mr. Deputy CHRISTIE in the chair.

After the usual business of the court had been disposed of, the adjourned debate, on the motion for reconsidering the propriety of continuing the opposition to the City Gas Company's Bill in the House of Lords, was resumed.

Mr. DE JERSEY's motion having been read by the clerk,

Deputy HARRISON said: Before I address myself to conclude the observations I have to make, and which I am prepared to do, there is one point upon which I wish to make a remark. I have been found a great deal of fault with, for having moved at the last occasion, that strangers be requested to withdraw. I mention it here in the presence of the mover of the resolution, and I am in the hands of the court in reference to the matter. I must say that strong reasons have been given to me why the public should be present instead of being excluded, and I feel that my case is so strong that it does not signify either way. If I were permitted, I could now tell you what has taken place between me and some other parties; but I am in the hands of the court whether the discussion shall take place with closed doors, or whether we shall consent to strangers being present. I am not in a position to offer an opinion upon the subject, because it is not my motion, and I perhaps cannot do so, but as I say, I am in the hands of the commissioners and Mr. De Jersey to determine the question before I begin.

Mr. DE JERSEY: My friend moved that strangers do withdraw. I felt the weight of his observations; at the same time, the opinion of my mind was that it was an open question. Whichever way the court determine the matter, I shall be content; I have only one desire to accomplish in this matter, and that is, that we should go forward in the right course—and I have no other wish.

Mr. ABRAHAM: Several gentlemen have spoken on this question, and we have debated the matter for two hours with closed doors, and therefore only one part of the discussion will go forth to the public. Obviously, that would be unfair. I have no objection, if the commissioners should be of that opinion, that it should be an open court, if those who have spoken upon the subject are permitted to speak again, should they desire to do so; but I do think it would be something extremely unfair to permit one part of the discussion to go forth to the public, whereas the former part was conducted with closed doors.

Deputy WHITESIDE: I apprehend it was something like a trial; you had gentlemen on both sides, and therefore I have no doubt that each side kept pace with the other at the last discussion, and as it will be the same again, I have no doubt, I, for one, hope that it will be an open court.

A COMMISSIONER: I think the mover should open his case again, so that the public may know the whole. At present the public are in the dark.

Deputy HARRISON: You will have his reply.

Deputy LOTT: I believe this is a question which comes to us in the shape of gas, and that matter has always been discussed with open doors and with reporters present. All our proceedings hitherto have been in the papers. Why this is to be a solitary discussion and taken out of the general rule, I do not know. I have heard no argument deserving the name in favour of it, and I do not see why we should make this an exception to the rule. I am sure it would create suspicion out of doors if we take such a course.

Mr. ABRAHAM: Is the whole question to be opened again, and may any member speak upon it? Is that to be clearly understood? (Hear, hear.) That is the only fair way of dealing with the subject.

Mr. ELLIOTT: That is the only fair way, and in order to complete our fairness, the conversation of last Friday ought to be considered merely in the shape of a rehearsal. ("Hear," and laughter.) My friend, Mr. De Jersey, should be allowed to make his excellent speech over again to begin with. No other way will be a fair way. We know very well that my friend (Deputy Harrison) would extremely like to block out Mr. De Jersey's speech, and then bring the full force of his own influence to bear—and we know it is tremendous—over the commissioners.

Deputy HARRISON: I cannot do it.

Mr. CAUSTON: I hope Mr. Ross will be here; likewise my friend, Mr. Barkly, for they strengthened the case of the City Gas Company, in my view, and I believe also in the opinion of many gentlemen here.

A COMMISSIONER: You had better send for them.

The CHAIRMAN: I was going to say that in the absence of any motion upon the subject, I shall keep to the rule of the court. The rule of the court is, that in the absence of a motion, if a gentleman gets up to speak who spoke on Friday last, it will be my duty to tell him that he has spoken.

Deputy LOTT: But if before Mr. Harrison begins you permit a gentleman to put forth such curious statements, one might perhaps be allowed to say a word upon them. Mr. Abraham has spoken before upon the question, and I thought it was a general rule that every member should speak once only. I know that every committee of the commission is monopolized by a few persons, who alone are allowed to address them.

Mr. RATHBONE: I wish to know whether, if any gentleman who has spoken is not present, the chairman has power to compel his attendance.

Mr. ABRAHAM: My friend (Mr. Lott) has quite misunderstood me. All I want to know is, whether we are to re-discuss the subject afresh altogether and each one is to have an opportunity of addressing the court, or whether only a portion of the discussion is to go to the public.

The CHAIRMAN: There being no motion to guide me, I am tied by the rule of the court.

Deputy HARRISON: I shall take but a few moments in opening the subject. I am certainly in very unfavourable circumstances, and it arises from this:—There are certain members of the court, one of whom has hinted to me this morning, that really upon the question of gas and the proceedings with reference to the supply of gas to the City he is entirely ignorant. The gentleman I speak of is a new member of the court, and never heard any discussion until last Friday, and is therefore not acquainted with the general bearings of the case. He informs me that other members of the court are in the same situation, which is very unfortunate, for I do not know how a gentleman can give a sound vote upon the question if he knows not all its bearings. Therefore, with the consent of the court—and I hope, gentlemen, you will not consider it wearisome—I will first refer to past transactions, so as to bring all the members of the court to the point at which we stand upon this question. I shall ask the indulgence of the old members while I go step by step through those transactions, so as to bring us all to the point at which we have now arrived. On the 11th of January, 1848, the chairman of the commission, Deputy Peacock, brought up a representation from the citizens as to the excessive price which was being paid for gas in the City of London. On the moment that that communication was made to the court, they felt the force of the observations made by the chairman, and they referred the matter to a committee to inquire into. The price of gas at that time was 7s. per 1000 feet. On the 18th of January (or immediately afterwards) the City Gas Company dropped their price to 6s. On the 25th of January a petition was presented from Bishopsgate Ward on the price of gas. On the 26th of February the committee met to consider that question, the directors of the City and Chartered Gas Companies attended, and both were pressed by the committee to reduce the price from 6s., but they both declared that they could not do so. On that occasion they appealed to the justice of the committee of this commission whether 10 per cent. was too much dividend to be paid by such a hazardous business as the manufacture of gas, which they carried on. No doubt it is a very hazardous business. I was one of the commissioners at the time, and we quite concurred that 10 per cent. was not too much for such a hazardous trade. But we pressed them to know what had been the result of their trading, and whether they had, in addition to paying large dividends, declared large bonuses? whether they had purchased up any shares of the company? or whether they had accumulated capital in any other form? because that formed a very important item for the consideration of the committee. To those important inquiries both companies declined to give us any information; they also distinctly declared and assured us that they could not make any further reduction in the price of gas. At this period began the proceedings suggested by Mr. Pearson, the City solicitor, which ended in the formation of the Great Central Gas Consumers' Company. On the 5th of December, 1848, petitions to the Common Council were presented, urging them, through this court, to obtain a reduction in the price of gas. On the 18th of February, 1849, the commissioners were petitioned by the ward of Farringdon Without to get the price of gas reduced. On the 2nd of March, 1849 (and I wish to impress very much this particular date upon the mind of every member in the commission, because everything turns upon this particular meeting as to the success or support which the City, Chartered, or Central Company should receive)—on the 2nd of March, 1849, the chairman and directors of both the City and Chartered Companies again attended the commissioners. Both were again pressed to reduce the price of gas to 4s. per 1000, and both again refused. There were many much-esteemed members of the court—and I may mention my much-esteemed friend, the late Alderman Lawrence, who was on the committee, and in his own forcible way pressed upon those gentlemen the question, and asked whether they would take time to consider it. He said, "If you cannot give us a reduction now, can you hold out any hope to us of a prospective reduction?" They both distinctly stated that they refused to do so. I do not wish to offend the feelings of any gentleman interested in the gas companies, but I call their attention to the fact, because my conviction is, that if those gentlemen had made something like reasonable concession to this court on that day—and I think I may say it without being much of a prophet, for I know the feelings of the commission, and I know my own feelings too—they would not, and I am sure I would not, under any circumstances, have permitted the streets of the City to be broken up to lay down mains for a new company. But, those parties having distinctly stated that they could hold out no hope that at any other time the price of gas would be reduced to 4s., the time was then past, and this committee entered into an agreement with the Great Central Gas Consumers' Company, by which advantages only to be measured by the difference in price between 4s. and 6s. per 1000 are to be ascertained.

Mr. WALTERS: One word. The question was 5s., not 4s.

Mr. PEAD: Was it not 5s.? That was the sticking point.

Deputy HOLT: These questions are very inconvenient.

Deputy HARRISON: On the 30th of April, 1849, the two companies reduced their price to 5s. per 1000 feet. On the 2nd of March it was that they were asked whether they could do so, and they assured us they could not—that their profits were so small they could not even give us hope of a prospective reduction—I say, that was on the 2nd of March, 1849; and yet, on the 30th of April in the same year, they did reduce the price of their gas to 5s. That is a fact, and I know the reason why—I can understand it quite. This commission was a popular commission; we had no interests in these gas questions, but were representing gas consumers to an extraordinary extent in the City of London, and they saw that we were determined to have justice done them. Our solicitor brought us evidence, and it was also brought by other parties, and it was seen that we were determined to have the price of gas reduced to 4s. per 1000. The companies, observing that we had begun a decided course with reference to this reduction, they then, within a month from the time they said it could not be done, did make the reduction, and came down to 5s. But let us carry that question a little further. In the following year, when the matter was again discussed, and we entered into arrangements with the Great Central Gas Company to supply——

Mr. CAUSTON: I really do not see what this has to do with the motion of Mr. De Jersey.

Several VOICES: Yes, yes.

The CHAIRMAN: I am of opinion that Deputy Harrison is in order.

Deputy HARRISON: I can understand that members interested in gas matters should sit rather uneasily in their places at these facts being stated.

Deputy LOTT: Name, name.

Deputy HARRISON: No, I am not going to trouble myself to do so; but let me say—for the truth must be told, and I want to give the history of these proceedings to those who are not familiar with them—there are gentlemen in this court who do not know one of the circumstances which I have been relating. I desire to give those gentlemen the fullest information, so that they shall not vote blindfold or be led away by the eloquence of the gentleman at the bottom of the court. It needs great virtue to stand against a speech of that honourable gentleman. I know it well, and therefore I want the facts to be borne in mind, that others may not be led away by statements which may be made when I sit down. When this question was debated by this commission (the last debate upon the question, and upon which that bill was founded), the meeting was held in the Court of Common Council, and it was the largest meeting of this court I ever saw. The court was so crowded that there was no room for the public to get in to hear. The judgment of the court on that occasion was that, though these parties had consented to a reduction, there was no dependence to be placed upon their giving a permanent reduction to 5s., unless permission was given to the Central Company to lay down their mains in the City. The result was by an overwhelming majority to secure for the ratepayers a supply of gas at 4s. per 1000. That is the history of these proceedings, so far as this commission has ever interfered with them, I believe. To suppose that we have any interest in either of the companies, as it has been said—but there, I will not do that injustice to any member of this commission to suppose that he thinks so. As I say, we have other interests to look at—and what have we done by our proceedings in 1848, 1849, and 1850, the year that this Great Central Bill was passed? Why, we have secured to the City a reduction of 2s. per 1000 in the price of gas. We began at 6s., we have secured them gas at 4s., and they have enjoyed that advantage from the passing of the company's Act up to the present time. Let us for a moment estimate what has been saved to them by the course of proceedings which we have adopted. The difference between 4s. and 6s. is—what shall I say, for the City of London? Will any one tell me that less than £50,000 or £60,000 a year has been, by the judicious conduct of this commission, saved to the citizens of London? More than half a million of money have we saved for their pockets within the last nine years by the reduction of the price of gas! No unimportant thing; and, if this were the only public matter with which I had been connected in my life, I should rejoice that I had taken an active part in it. It was a controversy which lasted three years, until I was utterly tired of it; but the result was such that I may class myself as one of those who were able to save the citizens of London no less than £50,000 a year up to the present time. It was the glory of this commission—I do not claim it all for myself, but I was one of those who accomplished this great end. Now, I have brought the matter down to 1850, the period of the passing of this Act. Let me say, I have felt much pained personally, and these gentlemen must have felt it very much, at the observations made upon the course of our proceedings in reference to this company. It has been attributed to us that we were influenced by certain motives, and that it was our desire to support certain individuals which induced us to take an interest in that company. I utterly disclaim anything of the kind. I should be altogether unworthy of any respect from the public if I were guilty of such a course. With that general disclaimer, I should be almost inclined to pass the matter by. But let me ask, what was the opinion of a competent tribunal in reference to this particular gas company? We are charged with being partisans, and with having no motive except to support one man to the prejudice of another, by counsel at the bar. Happily, I am informed that that counsel was never instructed to make those observations, and therefore I pass them by as the license of the bar; and when that was exhausted, and the sound passed from the ear, the effect of those observations ceased. At all events, justice there was none in the remark. But what was the opinion of the chairman of the committee which inquired into this very matter in the House of Commons? I will venture to read it; it is only about five lines, and it is from the *Morning Chronicle* of the 21st of May, 1850. I believe it will acquit this commission altogether of any personal feeling in the matter, and was a compliment to them for the course which they had pursued.

Mr. ABRAHAM: How could the idea have originated itself to counsel?

Deputy HARRISON: I do not know how it could. I read what was stated, and I do not wish to go into it further. I would rather avoid any observations upon it; but now you have thrown out the remark, I may say that I have been informed by a gentleman who is eminent at the bar, that no honourable gentleman at the bar would have used those observations attacking this commission, and individuals connected with it, except he had been instructed. I have a letter, which I cannot publicly use, which states that the gentleman referred to did not receive those instructions from the company. I would rather not say more, or follow the matter further, but think it was the mere license of the bar, and that the observations were made without the full force of them being felt, and without intending to inflict injury upon the feelings of this commission. I cannot help myself. If gentlemen say they did not instruct counsel to make those statements, you must take it so; but I do feel jealous about the character of this commission. What was the judgment of the chairman of the committee of the House of Commons after three years' controversy on the Great Central bill?

The honourable chairman, addressing the parties, said reference had been made in the course of the proceedings to the excitement which was created in the City upon the subject of better and cheaper gas, and he read a few observations which he was unanimously desired by the committee to make to the parties:—

"It is now agreed on both sides that gas shall hereafter be supplied to the citizens of London at 4s., with a possibility of further reduction in price.

"It has appeared in evidence that all parties originally objected to the introduction of a new company—if the object could be attained through the instrumentality of the companies already established.

"It has further appeared that the old companies steadily refused to make the required concession, and were only induced at last to do so by the organization and perseverence of the promoters of this bill; and that the consumers, therefore, are indebted to the promoters for the advantage thus obtained.

"Having referred to these particulars, the committee are willing, if the parties desire it, to adjourn a short time the consideration of the preamble."

Now, sir, Mr. Cardwell was the chairman of that committee, and after such a statement as that by a parliamentary committee (which had gone through a lengthened and anxious inquiry) as to the motives of this commission, I think we may stand perfectly easy for the future. However we may be impugned by counsel, while we have such a testimony, and know at the same time that the result of our conduct has been the saving of £50,000 a year to the gas consumers of the City, we may stand easy whatever attack may be made against us. In 1850 this bill was passed, and there was another bill; I do not know what it was, but it was a health of towns bill, and it pointed out as nuisances certain trades and manufactures, which it enacted should not be established within the limits of populous districts. Amongst the excepted trades were gas companies; but the City Gas Company was exempted from the operation of that bill—from their power in Parliament they became exempted from it. But it was clearly indicated that the establishment of such a nuisance in densely populated places could not be tolerated for the future. Now, sir, the commissioners have watched from time to time the proceedings of the City Gas Company with regard to its sanitary effects upon the neighbourhood. We have had proceedings from time to time under our consideration, in which they have been charged with committing a nuisance in the neighbourhood. Offensive odours are prejudicial to health—at least, as the medical gentlemen describe them, they have a tendency to lower the state of health; so that if there is any disease in the air there is a predisposition to be affected by it. My friend has suggested that we ought to have Dr. Ross here to-day who is the medical officer of health now attending the particular district in which the City Gas Company are concerned. I am sorry that he is not here. We have the testimony of the first men of the day

that gas-works cannot be established without their becoming a nuisance to some extent, and that they have the effect of lowering the health of the neighbourhood, and yet we have one of our own body giving such remarkable testimony as this. He says:—"I am the medical officer of this district, and I know another neighbourhood where the health of the people is worse, and I do not see so much objection to such a company." He is now the doctor to two districts, and the other being worse than this, he does not see so much objection to these works.

Mr. DE JERSEY: I am sorry to interrupt you, but Mr. Ross did not say so. I deny that that was Mr. Ross's argument.

Deputy HARRISON: I would not misinterpret it.

Mr. DE JERSEY: No; I am sure you would not wish to do so.

Mr. ABRAHAM: He admitted that he had not been the medical officer except for two or three weeks in the absence of the former officer, Mr. Digby; and it did seem somewhat remarkable that he should offer an opinion upon the state of health of the district when he had only been the medical officer for two or three weeks.

Deputy HARRISON: My friend has suggested the observations which I should have made myself. I think with him, that it was a remarkable testimony to be given by a gentleman of his profession after the experience of only a certain number of weeks. I was perfectly astonished at it; and I daresay Mr. Ross will have an opportunity of stating to his constituents before long the cause of the change of opinion which has come over him, for we have had a strong memorial from the ward of Farringdon Without on the subject, and Mr. Ross will no doubt have an opportunity of reading that memorial between the present time and another week or two, I daresay. I say it is declared to be a nuisance on all hands; gas-works are said to be a nuisance, and we admitted the other day unanimously—for there was no difference of opinion on the point—that such a manufactory in such a situation was a nuisance, and nothing could prevent its being so. The commissioners find that by the Act of Parliament constituting that company, there is a limit to their power and the occupation of the land for manufacturing gas. The company introduced a bill into Parliament during the last session, which was brought before this court. We considered its provisions, and the result of that consideration was, that we—I was going to say unanimously, but I will not say that, for I do not recollect that there was any discussion upon it, but the report of the committee was, that it was the duty of the commissioners to oppose that bill. That report was founded upon the recommendation of our medical officer. We appoint that gentleman to advise us, and he advised us that gas cannot be manufactured in such a situation as this without being a nuisance. We brought up a report on the subject, and the court agreed with us to oppose the bill of the company's on two grounds—the first is the sanitary ground, and the second is for the purpose of securing to the public the fourteen or fifteen clauses which were put into the Great Central Company's bill at our instance being inserted in the City bill, so that there may be some protection as to the price, quality, examination of accounts, and other circumstances. Now, Mr. Chairman, I say that if this commission means to be consistent, they must proceed with this opposition. They took that step, having considered the bill, having received a report from the committee, with instructions to take the necessary steps, which they did by their counsel in the House of Lords against the preamble of the bill. There was such an array of evidence brought up from professional persons in favour of the company continuing there, if they made gas upon improved principles, that we did not succeed upon the sanitary point. But let me call the attention of the court to the other point upon which they instructed us to oppose. We were instructed to obtain the insertion in the bill of the various clauses contained in the Great Central Company's Act. I am not a parliamentary agent, but we employed one of the best to be found in connexion with parliamentary business; and it was suggested by our parliamentary agent, on the advice of counsel, that we should not proceed with the other parts of our petition before the House of Lords, but reserve ourselves to proceed with reference to those other features—namely, price, and other regulations, before a committee of the House of Commons. Why they gave that advice to our representatives I am at a loss to know. I am told that it might not have been a favourable committee; at all events, these gentlemen had some reason of which I do not know.

The CHAIRMAN: Allow me to tell you what it is. According to the rules of the two Houses of Parliament, if you proceed to oppose a private bill in either House, and come to an arrangement in committee to agree upon clauses, you cannot proceed in your opposition in the next House. So that if we had agreed upon clauses in the House of Lords, and you had thought right to go on with the opposition afterwards in the House of Commons, if counsel on the other side objected, you would be thrown out and have no standing.

Mr. DE JERSEY: Hear, hear.

Deputy HARRISON: I am very much obliged to you, sir, for your explanation. It now shows me the sound sense of the decision we had from our counsel, and I am perfectly satisfied that we could not have had better advice or sounder. I find this to be the case: we had not determined what course to take till after we had passed the preamble, and then came the step. The preamble passing, that admitted that we had failed in our evidence upon the sanitary part. There is no doubt of it. Our counsel, with that quickness which belongs to them, saw that that was the great point with the commission, and therefore they said, if you go into the clauses now you will not be able to oppose in the House of Commons. It is true you failed in the House of Lords—you will not fail in the House of Commons.

Mr. DE JERSEY: Oh, oh!

Deputy HARRISON: Well, it is a matter of opinion.

Mr. ABRAHAM: It is very fair.

Deputy HARRISON: I know it is what I would have advised this commission to have done. We failed in the House of Lords; that was one of our great points, and if we had opposed on the clauses it would have prevented our going on with the opposition in the House of Commons. Therefore, as a matter of prudence and discretion, knowing that we were earnestly determined in our course to eradicate all nuisances, and knowing that we have no private interests to serve, but a public duty to perform, our counsel advised that we should not interfere with the clauses, but go to the House of Commons, where we can—not only be heard upon those clauses, but again upon the sanitary question.

Mr. DE JERSEY: I must object. I have not the slightest objection to the worthy deputy giving us his own opinion, but he is now putting it to the court that this is the opinion of counsel. It is his (Deputy Harrison's) opinion—but I say it is not so—and he should not put his observations in such a way as to entrap members into the belief that counsel have said so.

Deputy HARRISON: You do not seem to imagine that I am "up" in law questions.

Mr. DE JERSEY: I dare say you are quite *au fait* at them.

Deputy HARRISON: I give you my opinion, and I give it without a fee. I am only giving you my opinion as to the judicious reasons for the advice which counsel gave to this commission. Now, let me see. We were instructed to do something—what was it? To oppose this bill. Counsel did not think it right to go into clauses in the House of Lords. That fact was reported to the committee, and the committee brought up this fact in a report to this court, advising you to renew your opposition in the House of Commons. The court almost unanimously—a court consisting of 38 members, as I see by the minutes—agreed to that report, the only gentleman who took the slightest objection to this course referring to the expense. We feel that our public duty is beyond the question of £300. We are talking about a question whether you shall or shall not save the ratepayers £50,000 a year. Talk to me about a trumpery £1000 in opposing a bill! It is not consistent with the objects of this commission to make such an assertion. We have higher duties to perform, and I say that in a court consisting of 38 members it was agreed to by you, and referred back to the committee with instructions to take the necessary steps to carry out your views. We unfortunately were not unanimous in that committee, and the mover of this resolution, because he was in a minority in the committee, thinks it a good plan not to take the matter up at all; and he has ventured, against a majority of the committee and an overwhelming majority of this court, to ask you not to proceed beyond the second reading of the bill. The second part of his motion certainly suggests that you are to seek the introduction of some clauses by which the price will be reduced from 6s. to 4s., &c. Well, now, if there is any man in England who would go about a negotiation in that way except my honourable friend, I do not know the man. We are to disarm ourselves entirely, and say we will take no proceedings against the bill, and to give our compliments to the City Gas Company, and ask them to make their maximum 4s. instead of 6s. No doubt we should receive a polite answer to say that they would take the matter into their consideration. The mover of the resolution recommends you not to proceed beyond the second reading, and then in his argument he tells you that the clauses which you require can be obtained by negotiation for no cost at all. Now, that is the peculiar position in which we find ourselves at the present time. Our public duty as commissioners requires that we should look at the matter in a sanitary point of view, and that we should have regard to the price of gas; but my friend suggests that we should abdicate our duties as Commissioners of Health, that we should forego our duty as consumers of gas, and save £600 or £500 which the intended opposition might involve. It is too insignificant. I would not say anything disrespectful, because when I get outside that bar it is all nothing; but I say it is too insignificant, and I cannot believe the members of this court will ever consent to forego the opposition on such grounds. There is another matter, too. I think we are bound by the resolution of this court to continue the opposition. And there is another curious circumstance which has arisen, and I understand the meeting is to take place to-morrow. We have invited, by the direction of the court I think it was, or by direction of the committee, we were asked to meet the members for the City—our representatives in Parliament—to know what view they take of this matter, whether they will aid us, and what course they will take in Parliament upon the second reading. When is the meeting to take place? To-morrow. So here we are.

The CHAIRMAN: It is adjourned. It will not take place to-morrow.

Deputy HARRISON: That is the more reason for adjourning this question. I cannot conceive that the members for the City are dishonourable people. I mean to say this—the meeting was fixed for to-morrow morning, and, if I wanted a reason why we should not come to a conclusion upon a question upon which we have asked their advice, the meeting to-morrow would be a reason. (No, no.) Then it is put off till next week or some other day, but it was fixed for to-morrow. Allow me to say, at any rate, that we have determined to consult with them. Lord John Russell said he would see his brother members, and let us know. He has seen them, and we do not know at present the result of their deliberations. Is it not a curious course to take, while we are asking these gentlemen to advise us as to the course we should adopt, that we are to proceed to a determination of the matter? I think such a course would be offensive to any gentleman, much more to the representatives of the City of London in Parliament. We cannot mean it so, but that must be the construction put upon our proceedings. After I have been and asked my learned friend, the member for Aldersgate (Mr. De Jersey), what is his opinion upon some important question, and he says, "I will consider of it, and let you know in a few days"—in the meantime I go and act for myself, contrary to justice and common sense, what would my friend think of me? He would not permit me to ask a question of him for the future, I am sure. I think now I have given sufficient reason why we should go on with the opposition. My friend, in opening the case, said it was a question of money. It may be, but is it a question of money for us only? The question of money is a question for this company. We have nothing to do with the management of this company; what we have to do is to secure a thing that is good and cheap. But it may become a question of money to them. There has been some exaggerated evidence about the cost of removing their great buildings out of London.

Mr. DE JERSEY rose to object.

Deputy HARRISON: It is an exaggeration as it appears to me. I should like to know what the value of the surplus land would be if they do move. Why, you cannot put it down in figures. They say it will cost them £150,000 if they are allowed to have storehouses there, and are required to manufacture gas out of the City of London. Does any one mean to say that it will cost them £150,000 to do that? Is not all the evidence we can get (and here is one of the difficulties of discussing such matters with open doors) to the effect that they can manufacture gas out of the City of London at a less price than they can in? And is not the reason manifest? They are obliged to go to all manner of expensive processes to remove from the manufacture all pernicious odours, so as to make it endurable at all. These are sources of great expense to them, but if they manufactured out of the City they could do it at much less cost. And if you give them storehouses in the City, surely the cost of removal cannot be anything like the sum of money they state. Now, I say this is one of the evils of addressing ourselves to such a subject in open court. What is the evidence which has been given to us? I will go across the water, and I will venture to say from the evidence given to us, it has been shown that gas-works have been removed from the city of Paris, and that the gas is made at a less cost than before and with advantage to themselves. I am glad to see my friend Deputy White here. Let me ask him, with regard to Paris, what is going on there? They have taken three gas-works out of the streets of Paris, and they are not celebrated for sanitary movements either, though they are making some beautiful streets. I cannot tell you the effects. I am tongue-tied, but I can tell you that three companies have been moved out of the city of Paris.

Deputy WHITE made some remark, which was not audible below the bar.

Deputy HARRISON: I will not go into it more deeply than I have done. But, gentlemen, I contend that the sanitary condition of the City requires, and will be improved by it. What do we want more? Are not these overwhelming reasons why we should pursue the opposition of the bill, in order to remove these works from the City of London, and to obtain for the citizens of London the best description of gas at the smallest possible price to the consumers. Now, I daresay my friend will say that there is a clause in the bill

that they shall not exceed 6s. There is; and it is a very mischievous clause, though a very simple one. I call 6s. a very mischievous word in that clause, when we have had for the last ten years gas supplied to us at 4s. per 1000. And here I am again inconveniently bound by this being a public discussion, but I can see that the passing of that clause will be damaging to gas consumers. I can easily conceive that a company which has charged 4s. by Act of Parliament will ask for an extension. Another company, who have got no such limitation, may get to light the whole City and charge 6s.

Mr. De Jersey: No, no.

Deputy Harrison: My friend says "No, no," but I have lived to see many strange things in my time, and many unexpected results come about. What we want is, that real competition shall continue in the City; it is to continue that real competition that I am anxious at the present moment. I do not wish to see more than 4s. charged for gas; and if there is anything I can do to prevent an alteration in this respect, though I am not in such good health as I was, I shall do it. But I can conceive of a combination of circumstances most prejudicial to the consumers of gas in the City; and I do see a point at which this commission, who have done so much up to the present time to get that 6s. reduced to 4s., should interfere, to keep the limit to 4s., and if that can be done, no doubt it will remove great objections to the bill. My friend, by his look, seems to say that that will not be difficult, and if that is the case, I give him my hearty support. I have put this matter as clearly as I can before you, and I hope that I have not exaggerated it in any way; and I hope, too, that there is now no member who does not understand the position of ourselves with reference to this bill, and also what is our duty if we can maintain that position, as Commissioners of Health to the City of London. In the peroration to a speech, we generally find the principal points recapitulated; so my friend who moved this motion suggests that it was absurd our going on with this opposition, and almost inconsistent. "How could we think of doing it," he said, "without having taken the opinion of counsel upon it, as to whether we should renew our opposition in the House of Commons?" Why, do we ask the opinion of counsel when we are going to spend £1200 to pull down some houses and open a court? Do you ask counsel about that? No, gentlemen; we consider it one of our functions as Commissioners of Health, at £1200, to pull down some houses, say in Fetter Lane——

Mr. De Jersey: Question, question.

Deputy Harrison: I say it is the question; we do not take advice upon the subject. I do not find fault with the objection at all; I am only saying that we do presume to judge for ourselves of the value of these outlays when we are spending the money of the ratepayers. And I contend now, that we had only our own judgments to consult, and shall not be considered as wasting the ratepayers' money in pursuing this opposition. We do not ask counsel's opinion what to do in sanitary matters; it is a totally different part of the inquiry. There is our officer upon sanitary matters (pointing to Dr. Letheby); it is not a barrister in the House of Lords. We have our adviser, we pay him an excellent salary, and he is a learned man. We depend upon his judgment, and he has advised us that these works are a nuisance. It is upon this advice that we instituted these proceedings. The best of all counsel we have—there is the gentleman appointed to advise us on these questions. The next reason why we should not have anything more to do with it was, we had a verdict against us. What! does a solicitor never recommend a new trial? I never heard such a thing. Here is one of the boldest men in this commission when he tackles nuisances in other forms except gas, and yet he is milk and water here. Why, he is worse than that. He says we have got a verdict against us. Let me ask him what is the reason for a new trial?—misdirection. How can there be a verdict when only one side of the case has been heard? You only went upon the sanitary point, you did not say anything about price, quality, &c. You were not heard on these points: how, then, could there be a verdict? But my friend says, "You have done enough, and I advise you to do nothing more, because you have a verdict against you!" I never heard anything like it. If we mean to do our duty, let us do it; if not, let us make way for somebody else. But to say that because we have been unsuccessful in a righteous cause at one tribunal we are not to attempt to get the decision reversed at another, is most astonishing. It is what one does not do with one's own affairs, and I hope it will not be the case here. It will make us ridiculous if in our public proceedings we adopt a course which any one of us, looking at his own private affairs, would not think of taking. The concluding observation made by my friend was, that we had not taken counsel's opinion, that we had a verdict against us, and that we should be wasting the ratepayers' money. Well, if that argument has not been shaken to pieces, and is not almost as nothing in your minds, I do not know what can do it, when you consider that the bill now contains a clause enabling this company to get 6s. for what we are now paying only 4s., the difference being about £50,000 a year to the gas consumers. If that argument is not strong enough to meet the observations of the mover of this resolution, I shall be utterly at a loss to provide another which can come up to it. Under the circumstances, my friend has utterly failed. He has astonished everybody after his usual proceedings upon gas questions. I do not stand alone in that position; he has astonished everybody in this commission. I do not know how it is, or why. I regret to see it, because I feel he was right before. He has been consistent before against the introduction of nuisances everywhere; but here he will not only admit a nuisance in the City, but purposes to adopt a course by which his neighbours will have to pay 6s. instead of 4s. per 1000 for gas. I hope the court will reflect before they agree with him. I do not know that there is any other point with regard to the history of the case that I have not referred to. I hope the court will refect. Let us try to be consistent. We have tried to go in the right course hitherto, we have been uniform in our proceedings for the last ten years in reference to this question, and I hope this day will not see us change that course which I believe has been so beneficial to the public. My friend (Deputy Holt) has suggested to me a matter which strengthens my argument in reference to this company. They have been charged with committing a nuisance. I will pass by the insinuation that these charges originated with us, and that others were used only as puppets in the affairs. It is true that various nuisances have been alleged against this company, and there is a conviction now standing against them upon which they may be called up to judgment. This company is, I am informed, most admirably conducted, though I am unable to say anything about it from personal observations, as I have not had the opportunity of going over their works. But it is declared to be a nuisance—declared by law to be so. Then my friend says it is a question of money; but I say we have only our duty to perform. If it is a question of money, let the commission say how much they will expend upon it. I will not do injustice to any one, but I am here to represent those who are largely interested in this question; and notwithstanding the inconvenience and unpleasantness which it causes, I am prepared to do my duty to the last moment. One word and I will sit down. This matter was referred to a few courts ago, and I could not help feeling excessively annoyed at that moment (I felt it more then than I do now) by the insinuations thrown out as to the motives which have influenced me for many years. I believe I was led to make some observations with respect to the chairman of one of the companies, who is a very highly respectable man. I was led to make that observation (not personally, for I can make a speech here, and debate a question with members of this court, and not quarrel with any one); but I made some observations to the effect that in statements which this company have made they have not always borne that character for consistency and for correctness which a company in their position should do. I have read you dates to-day which will show you over and over again that they have said that certain things could not be done which afterwards they have done. The last day the honourable chairman of the company was here, he said he would do something which, for reasons given to the chairman of this commission, he did not do. Individually, I know of no person more honourable than that gentleman; but with reference to these transactions with this company, I do say that where there is so much interest at stake, the observations made must be looked at with a great deal of care. Thanking the commission for having heard me at this length, I hope and beg that we shall not depart from the course which we have adopted with reference to this gas question for the last ten years.

Mr. Causton: With reference to the remarks which have been made, I believe there is a clause in the bill fixing the maximum price at 6s. But, considering that the other company cannot——

Mr. Abraham: Mr. Chairman, Mr. Causton spoke upon this question before.

Mr. Causton: I think not.

The Chairman: I have just refreshed my mind on the subject, and I have asked Mr. Daw to confirm my view, which is this:—The motion was moved by Mr. De Jersey, and seconded by Mr. Barkly, each speaking. Then, as an amendment, "The previous question" was moved by Mr. Abraham and seconded by Mr. Davis. Then, I believe, Dr. Ross, and afterwards Deputy Harrison spoke. I believe those are all the gentlemen who have spoken. I think there were only two moving the motion, two the amendment, and Mr. Ross.

Mr. Causton: With reference to the observations of Deputy Harrison, that there is a 6s. clause in the bill, it must be remembered that the other company, whose mains run along side by side with theirs throughout a certain district in the City, cannot charge more than 4s. Now, is it at all likely that I myself, as a large consumer of gas, should consent to pay the City of London Gas Company 6s. when I can get supplied by the Great Central at 4s.? Now, there has been a vast deal made of this 6s. In my opinion—and it is the opinion of the company—they care nothing about it. But there are certain things which the company have felt displeased about, and I am not at all surprised (I am not directed to make these observations, but I glean it from the remarks made at one of the meetings of the commission). There has been a vast deal of feeling manifested against this old and very respectable company, but what is the fact? They used to light certain streets (the public lights), and their charge was 4s. The Great Central Company put in a contract to supply at £3. 12s., and they did supply it for twelve months at £3. 12s., but now they are charging four guineas. I do not like to be ungrateful to old friends. Here was this very respectable company supplying gas at 4s. long before the Great Central came into existence. But then you made a sudden alteration, and now you give them this sudden rise. Now, I do not think it is quite right, and I think that the old company have just cause to suppose that there is some influence working in this commission which is unfavourable to them. Now, I can assure you, gentlemen, this is not my course. As I have said before, I do not like ingratitude, and I think we are very much indebted to the old companies. (Hear, hear.) And you must remember that when these companies were established, they could not bring gas-works into existence without very considerable outlay; and where it would now cost probably £150,000 to provide works of the same magnitude in the present day, they had to expend probably £400,000. Now I ask you, gentlemen, whether it is at all fair on the part of this commission to continue an act of persecution against a company that visibly has been of so great service to the public? For my own part, I hope and trust that, instead of occupying the commissioners' time any more with this matter, it will be put an end to. Now, what have you done? You have actually appeared before the House of Lords for I don't know how many days.

The Chairman: Four days.

Mr. Causton: And you have expended nearly £600. And then look at the evidence. I regret very much indeed that my friend Ross is not here, and I am very sorry we had the discussion with closed doors the other day. The evidence given by Dr. Ross, and also by Mr. Barkly, was of that character, that, upon my word, it was so convincing to my own mind, and must have been convincing to every independent man. I am thoroughly convinced that every member here must have felt in his own conscience that the evidence given before the House of Lords upset any opposition which you may be prepared to give even in the House of Commons. You were before the committee of the House of Lords for four days, and it was suggested here the other day, with closed doors, that this might last for fourteen days in the House of Commons. We will take the expense in the same ratio, and if for four days it cost you £600, what will it cost for fourteen? All I can say is——

Deputy Harrison: Give us your opinion.

Mr. Causton: Is it worth while to expend £2000 or £3000 in further opposition, and for what I call "a myth?" You are fighting with nothing. You are fighting against the most important evidence given by the first chemists of the day. You are fighting against a committee of the House of Lords composed of men beyond suspicion, although some doubt has been thrown upon them. Why gentlemen the other day, with closed doors, said that though they were in favour of going on with the opposition, they felt so convinced by the evidence given before the House of Lords, that they (Dr. Ross and Mr. Barkly) said: "For goodness' sake, don't go on." I should like to ask the medical officer whether he thinks with such a meagre, paltry source of evidence as you are able to produce before a committee of the House of Commons, there is any possibility of your succeeding? I believe not; and I think the doctor will tell you so.

Mr. Abraham: I believe he will not.

Deputy Holt: Let the doctor alone.

Mr. Causton: I regret that I have not taken a few notes to bear upon the observations of Deputy Harrison, for really he is very earnest; but I think there is something more than meets the eye.

Deputy Harrison: I am sorry for it—that is, if gentlemen think so.

Mr. Causton: I cannot understand why the worthy deputy should be so anxiously watching this matter, and so eager to spend money. I say this—I do not wish to be considered a mean man, and I do not wish to be considered an extravagant man, but I wish to be a just man. Now, gentlemen, if I be a just man, I shall certainly vote against any further opposition to this bill in the House of Commons.

Deputy Holt: I think it is almost presumption in me to endeavour to offer any observations after the great talent which has been displayed on both sides. I submit that the whole case has been so well gone through, that it is merely an encumbrance for me or any one else of my class to offer

a remark. But I must say that I have seen gentlemen so strangely alter their opinion—men who I pinned my faith to for the last quarter of a century—men on whose judgment I felt I could well rely upon most things—nearly all—but in this instance they have deviated so from their regular course, as certainly to inspire me with some degree of alarm and warn me that every one must look well to himself and take care of his own interests. The speech delivered by the honourable deputy for Cornhill is, I submit, highly satisfactory to the members at large. I know that it is to me. All that he has ever done in his public capacity has been for the interests of the constituents whom he represents, and my friend who last spoke, must take out of his mind all that idle notion that we are fighting for individual opinions and interests of our own. We come here to discharge a public duty, and we are bound to give each other credit for the course which we take.

Mr. CARTER: I did not say it.

Deputy HOLT: I conjure the court, as they have the means at hand, to bind this company to a price which we say the other companies are able to supply gas at. Is it not an astonishing fact that £50,000 has been saved to the citizens of London?

Deputy HARRISON: Per annum.

Deputy HOLT: £50,000 per annum! We are all participators in it, and we are not arguing for ruinous prices, for we see that the company, which are bound to supply gas at 4s., are thriving well; and if the whole machinery was of such an expensive character originally, we know that in the present day we can bring matters to bear at a much cheaper rate. We used to travel by the stage coach, changing horses every ten miles; but now we travel by railway and get over as much ground in an hour as formerly took a day. All these things are not to bias our minds. We must look at the improvements around us; and those gentlemen have the opportunity of profiting by them. They have got the plant, and they have worked the marrow out of it; they have had the advantages in past times, and have paid themselves enormous dividends at the expense of the citizens; and they must now take a share with their fellow-citizens.

Mr. CAUSTON: So they do.

Deputy HOLT: I say they should not persist in getting a bill through which contains clauses so pernicious.

Mr. DE JERSEY replied: He said, I have several causes of regret in this matter. One is, that as we met to consider this question on the last occasion, we did not decide it then. The question was then fully opened and discussed, and the fair mode would have been to bring the debate to a close then. On that occasion you are aware the doors were closed, and the public have not had the advantage of learning what was said on the subject. As regards what I said myself, I neither know nor care whether the doors are open or shut. But when I recollect the speech of Mr. Ross on that occasion, I do regret that the observations made have not met the public eye, the more especially when I find on this occasion that we are now debating the question with open doors. Therefore, however it arises, there is a want of fairness in our proceedings. I speak also under very great disadvantage; for this reason—many members who were present on that occasion are not here to-day. I could name four or five who are not here to hear the discussion and to give their votes. We debate the question on one day, and meet to decide it on another. If all the members who were present on that occasion were present to-day, I should say it was a fair way of deciding the question; but as it is, I cannot consider the decision of to-day as altogether fair. Sir, Mr. Deputy Harrison has taken up this question in a very extraordinary way—to my mind in a most extraordinary manner. For a length of time I was wondering what he was at—I could not for the life of me make out what he was about. I now find out what it is. There is a spirit of competition, and we find—what I kept studiously away from the court—the Great Central Gas Company is talked about. Why? I can associate that idea with, to my mind, a most extraordinary circumstance, that when we sought to have an interview with the members for the City of London, to consider what we should do in this case, as the Remembrancer, as our officer, was to go to those gentlemen and get an appointment for us to see them, the committee was as much astonished as I was that the answer brought back was not by the Remembrancer himself, but a message was left by a clerk that the meeting was to be held at the Mansion House by desire of the Lord Mayor! It is fraught with suspicion when we find a question discussed in this way, and the parties who oppose my motion let it in by their own case: it is fraught with suspicion in many forms. What was the course pursued by many members?—what was the answer yesterday?—yourself included, sir? "I will not go;" and another one—"I will not go,"—"No more will I,"—"Nor I." I should be ashamed to be a party to go to the Mansion House in that way. And, let it be known, the meeting was appointed by some one, but nobody knows who, to take place at the Mansion House this morning.

A COMMISSIONER: It is put off.

Mr. DE JERSEY: Exactly so, and I hope the feeling of the committee has reached the ears of those it ought to reach, and that is the reason.

Deputy HARRISON: I only heard it this morning.

Mr. DE JERSEY: I hope it has reached the ears of some people, and that is the reason why it is put off. Now, Mr. Chairman, my friend entertained the commission with a long set of observations and a long recital of facts which took place ten or a dozen years ago. What has that to do with the question, I should like to know, except that his feeling was to place before the public the praises of the commission—to show the high position taken by them under ordinary circumstances formerly? I think not; but when people are so specially careful to protect their characters when they are not attacked, then we begin to think that people have not that conscience void of offence which is so desirable. (Oh, oh!) I cannot think, when my friend desired to salve the committee and to throw over them the halo of his approval, to place before the world what we have done, and to say "Look what we have done," that it was at all necessary to be brought forward upon the discussion of this simple question. It is a question which does not admit of such an argument, if fairly stated. I am not here to say what the commissioners have done, or what they have not done. I will take for truth what my friend has uttered, and I will not attempt to gainsay it, but what does it matter? But let my friend mark the fact. "We can find you in gas at 4s. for private consumers, and the public lights at £3. 12s.," says one company. But do they do it? Do they not raise the price year by year?—have they not raised their price? Is not that the best evidence in the world of what? Why, that it is a falsehood; a false statement got up for the purpose, at that time, of misleading the public and doing what many fraudulent shopkeepers do, put up articles and ticket them at a price to draw people into their shops. Why? They know they are selling them at a loss, but it is a piece of clap-trap to put before the public (I speak before the public). I can prove it out of their own accounts that they cannot light the public lights at £3. 12s., supply private consumers at 4s. a 1000, and pay a dividend of 10 per cent. It is a falsehood, and they have proved it by their own testimony in legal proceedings, by their own witnesses. In the Croll arbitration they proved, what almost amounted to—I had almost said—, but I will not—but they have proved that it was altogether, from beginning to end, a concocted piece of proceeding to gull the public. And the result comes out, that though we paid £3. 12s. then, we pay £4. 10s. now. And why? Either now we are overcharged, or they told a falsehood then, or they were so misled, or so ignorant of their proceedings, that they gave that as testimony which is of no value, because it is not truthful. I am sorry to refer to matters of this description, because they have no more to do with the case than if we were talking about what is being done in the Indies. The simple question is, shall we continue the opposition to the company's bill in the House of Commons? My friend has taken a wide range with his gun, but I shall point mine to the spot at which I wish to arrive—viz., the continued opposition to this bill. My friend has tried to persuade the commission that I am opposed to any opposition, but that is not so; he has told you that I have changed my opinion, but that is not so, and I defy him to point to any one thing I have done or given expression to, which will show a change of opinion on my part. When I was ingenuous enough, in opening my case, to admit that as regards gas-works they were in effect, necessarily, to a certain extent, a nuisance in the City, I am sorry that my friend should impute to me a change of opinion. I am not one of those who change their opinions except I have sound and good reason for it. I will explain to you presently what my views are, and that will show what wrong statements have been made by my friend. Now, sir, he has told us about our favouring one body against another. I took down as nearly as possible what his words were, but I cannot tell you what he meant. "One body against another." What body? Is he again introducing the Great Central Company? Why? What has it to do with this question? This is simply a question of whether the City Gas Company shall be permitted to have their works in the City. What has that to do with favouring one company against another? Does my friend know this fact, that not many years ago other companies in neighbourhoods as thickly populated as this, as I think the surveyor would say if he were asked the question—I might mention the Chartered and the Phœnix Companies—obtained charters of incorporation in perpetuity? Who from? The Legislature. The Legislature at that time thought that they were entitled to have Acts of Parliament in perpetuity. Why has a change come o'er the spirit of the dream? It it that the works of the company are worse now than then? Your medical officer will tell you, and his evidence went to that effect, that the works of this company are conducted in the best possible manner, and that no more nuisance than can possibly be helped is created by them; that every improvement which scientific knowledge can suggest has been brought to bear upon them, and that at the present time it is not possible for them to be conducted better. Why, then, has a change come o'er the spirit of the dream? The answer is given in the argument of my friend, in which he amplified so much upon the Great Central Gas Company. "Competition," says my friend—"one company against another." Yes, but if it had not been that the Central Company was in the opposition, we perhaps should not be in opposition. My friend made a great point of saving £50,000 a year, and he elaborated it as if what the commission had done had brought it about. But grant it, and what has that got to do with it? He uses this as an argument now. "What, he says, "is £1000 spent in opposition, to £50,000 a year saved to the ratepayers?" What, is he going to save £50,000 more?

Deputy HARRISON: I should be glad to do it.

Mr. DE JERSEY: Is he not aware of this fact, that competition will put that matter right? Is he aware of this fact too, when he talks so much about a maximum of 6s. being in this bill, that the clause to which he refers was introduced in blank? Who inserted the 6s.? Why, the House of Lords themselves. It was not the company's insertion, for they introduced the clause in blank. But whether the price be limited to 6s. or to 4s. is not the question here. I have in my motion said that we should endeavour to get those clauses inserted in the bill which are in the Great Central Act, as to price and other matters. But my friend as cautiously kept that from your view, and therefore I must read my motion again that you may see what my intentions are. And I can tell you more, for there is no doubt about it, that if the company were spoken with upon the subject—if negotiations had taken place between the company and this commission, they would have me tyou in every possible way in order to carry out your wishes for the benefit of the public. There can be no question about it; but if you wish to lower the price of gas and to keep it down, it must not be by adding to the expenses of the company. If you tell them that they shall remove their works and go to £50,000 or £100,000 or £150,000 expense, it is a very curious and novel way to obtain a reduction, and no one but my friend would have used such an argument. Be that as it may, the price of gas is a thing which will be regulated by competition; and if you have one company which is bound to supply gas at 4s. and cannot alter that price, competition will soon bring down the other to the same rate of charge. My friend has talked about the opinion of counsel being employed, and he put it before the court in such a curious way that I think he must have meant it joeosely. He said you do not ask the opinion of counsel when you are going to remove a lot of houses, because that is a sanitary question, and our sanitary officer is the proper authority to ask upon a matter of that description. True, it is so; but he would make you believe that I have said the contrary. I never did, but he saw fit to misinterpret what I said. What I said was this, that when the question came before this court upon a report as to what was done in the House of Lords, it was referred to the committee on improvements to carry on the opposition. I should like to have the words of the resolution referring to the matter read.

Mr. BLAKE (the assistant clerk) read the resolution of the court of the 19th of April—"That it be referred to the improvement committee to take such steps as they may consider expedient to oppose the City of London Gas Company's bill in the House of Commons."

Mr. DE JERSEY: What did the committee do upon that? They immediately came to a resolution to employ Mr. Remembrancer to oppose the bill and take the opinion of counsel upon it, without having come to any resolution as to the way in which they would continue the opposition. My friend talks of my being in a minority. The committee was composed at that time of eight members, and they considered that the resolution which has just been read made it compulsory upon them to oppose the bill in every possible way. I said my opinion was, that it was not compulsory, but that it was left to the discretion of the committee. It was "as may be expedient," and I took issue upon that point. What was the result? Five voted one way and three another; that is the minority to which my friend refers. Then I thought it was desirable to come again to this court and re-consider the question of the expediency of opposing the bill, and that the court might give an opinion as to whether it was intended that the opposition should go the entire length of the bill. With respect to the advice of counsel, what I said was this, that it was the proper course to pursue. What did the Remembrancer do? He took the opinion of counsel upon the evidence, and what do you think the opinion was? "If you proceed with the opposition," then you must do so and so. It appears to me, from my experience as a man of the world (though I am not so good a lawyer as my friend Deputy Harrison, yet, having had some experience during the last thirty years in the law, I may be permitted

to form an opinion), that when you have had a decision against you—yes, a verdict against you in the House of Lords, though they might be open to the unparliamentary observation of having acted unfairly—but when you have had a verdict against you, your case before that tribunal having been conducted by counsel of eminence, the proper course was to put the matter before counsel, and ask the question whether, looking at the result of what took place in the House of Lords, the evidence given on the one side and the other, and the character of that evidence, is it your opinion or not that we should have any chance of success before the tribunal of the House of Commons? That would have been a proper course to take, because this is not a sanitary question like that of the taking down of houses. Without an open bold question like that being put before counsel, no prudent man would dare to take such a step. And let me tell my friend that the law in some cases decides that it shall be so, in order that the courts of law may not be troubled with unnecessary appeals. We have had a verdict against us in the House of Lords, and let me ask what chance we have of succeeding elsewhere?—because you know we had every chance of opposing there. We went at it manfully, tooth and nail. No expense was spared, for we spent £600 upon it. And what was the result? Why, that every man we attempted to obtain as a witness in the House of Lords was engaged against us. Mark that fact. Of the best, the ablest out of the number of persons we applied to, nine out of ten refused because they were either engaged against us, or declined to give evidence against the company, or were themselves engaged in other works. And I put it in this way—if you could not get them in the House of Lords, where are you to get them? Can you manufacture them? Can you create them? Are they to spring out of the earth? You are on the horns of a dilemma: you had the opportunity of producing your evidence in the House of Lords—if you could do it, and did not, you have neglected your duty; if you could not produce it there, where are you to find it to support your case in the House of Commons? That is the question for you to consider. Then, again, my friend has talked about an indictment against this company; and Mr. Abraham the other day spoke in the same way, and quoted an opinion given by Sir William Congreve in 1821. Ask your medical officer what is the difference between the process of manufacturing gas then and now. It is absurd to quote an opinion upon the subject given in 1821, when the change in the mode of manufacture is so great as to make it quite another thing. What was then a nuisance is no nuisance now. True, there was an indictment against this company, but when? Years ago; and they were not called up for judgment. Why? My friend should have stated that it was because they were under promise to abate the nuisance. If they had not abated the nuisance, they would have been called up; they have abated the nuisance, and therefore they have not been. I should like to see my friend move that they be called up for judgment. But why should he refer to a matter of this sort, except to throw a little odium on the company? They have done everything they could, everything that science has suggested, and your own medical officer says that their works are conducted in the best way, and nothing that science teaches has been neglected. The House of Lords, by passing the second reading of the company's bill, affirmed the principle of it, and the committee of that House to whom it was referred unanimously—I do not care whether rightly or wrongly—upon hearing the evidence, came to the determination that the preamble was proved—that is to say, that the works are no nuisance; or rather, in other words, that the company ought not to be compelled to remove their works, but might continue them in perpetuity. That was their resolution after hearing the evidence. Most of the members around me have been upon juries, and I should place very little confidence in their judgment if, after reading that evidence, as given in the JOURNAL OF GAS LIGHTING of March 29, they did not say that the weight of it was so entirely in favour of the company that it was morally impossible for any one complying with his duty and regarding his oath to give judgment in any other way. The committee had to decide upon the evidence given to them; if we could have given any other evidence than we did, we were bound to do so; if not, it shows that the weight of testimony was in their favour. We came to a resolution, very properly, to oppose the bill—I have not changed my opinion upon that point—and we did so; but, the House of Lords having decided on sanitary grounds that this is not a nuisance, is it a necessary part of our duty, in the face of that decision, to continue the opposition? I recommend you to oppose the second reading in the House of Commons, because I think the House should know what we think upon the matter; but, having thus done our duty, I think we should leave the responsibility with the public upon them whether this is a nuisance or not. If, by a large majority, the House of Commons should support the second reading of the bill, where are you? I am not surprised that my friend should wish to stand so clear in the matter, for it would be then a factious opposition on our parts. But, says my friend, "I will not leave it to the House of Commons to spend the ratepayers' money in this matter;" and he talks about £50,000 being saved. I wish to save the ratepayers' money, but does he hold out any hope of being able to save £50,000 or 50,000 pence in the next ten years? Why, you know, it is amusing but not interesting, because it is not to the point. It is well known what took place in the House of Lords, and that four days were occupied merely on the preamble. If you go into the House of Commons it will take fourteen days, and your £600 expense will have to be multiplied into thousands. And you are to charge the ratepayers with this—you are volunteers in a matter of this kind against the Legislature, who a few years ago passed Acts in perpetuity for gas-works in as thickly populated places as this is, and in opposition to the House of Lords, who have passed the preamble of this bill. I say it will be a wilful waste of the ratepayers' money to do so. Now, with regard to the inhabitants: are these works a nuisance to the neighbourhood? Why, how could the company have got up a petition signed by 370 inhabitants, many of them in the immediate neighbourhood, some next to the works—such men as Gale, Baker, and Oldfield; such men as Charles Price and Co. and Bradbury and Evans, and others in the neighbourhood, if these works were such a nuisance? Why, here (referring to a copy of the petition) is column after column of signatures of persons living in the immediate neighbourhood, who say they have felt no nuisance. I will not trouble the court further, but will sit down by saying that I have been misinterpreted, and that I have only one object and desire in reference to it, and that is, not to waste the public money in this matter. My friend says, Let us be consistent; but I should not be consistent by persevering in a factious opposition to anything, whatever it may be. Having done our duty by opposing in the House of Lords, let us throw the responsibility upon the House of Commons of deciding whether this is a nuisance or not. With regard to the introduction of clauses as to the price, &c., as in the Great Central Act, I venture to assert that there will be no difficulty whatever if negotiations take place upon the subject, as I am quite sure the company do not desire to throw away their money; for what has cost us £600 must have cost them £2000, and they are not disposed to expend more if they can get their bill upon fair and reasonable terms. With these views, I say that we have already done our duty, and that we shall exceed that duty if we oppose the bill in the House of Commons.

A division then took place, when "The previous question" was carried by a majority of two, the numbers being—for the amendment, eleven; against it, nine. The effect of carrying the amendment is that the subject is remitted to the committee to oppose, either on the second reading or in committee.

WESTMINSTER DISTRICT BOARD OF WORKS.

The Monthly Meeting of the Parishes of St. Margaret and St. John was held on the 10th inst., in the Board-Room—Mr. GODSON in the chair.

The Board considered the report of the special committee of April 20, "To ascertain and report upon the proceedings before a committee of the House of Commons with reference to the gas inquiry;" also a letter from Mr. Beal, and report of the delegates thereon. A motion by Mr. Mallock was then agreed to—namely, "That the above report and documents be printed and circulated, and a special board on the subject be convened on the 17th inst." The next business was to elect a representative at the Metropolitan Board, Mr. Alexander Wright, the late member, retiring by rotation.

Mr. MALLOCK said he had proposed Mr. Wright to that office three years ago, when that gentleman was comparatively little known. He had now the fullest confidence in moving that Mr. Wright be re-elected representative at the central board, believing that the interests of the district, as well as the metropolis generally, would be efficiently served by such an appointment.

Mr. CLARK having seconded,

Mr. LOWNDS observed that he proposed three years ago Mr. Miller, M.P., to the above office, not having any acquaintance with Mr. Wright; but since then he had learned sufficient of the energy and talents of their late representative to induce him to support his re-election.

The CHAIRMAN felt induced to oppose the election of Mr. Wright for several reasons. He objected to certain views he had put forth in a lecture on the sewerage question, and because Mr. Wright had neglected to attend the board and furnish them with progressive information on those public questions coming before the central board, as he was in duty bound, though he had contrived to be present when gas questions were brought forward. The central board was especially established as a main-drainage board, and to effect the purification of the Thames, towards which, however, little had been done. The chairman then, in eulogistic terms, proposed Mr. Samuel Hughes as representative at the board. He would observe that Mr. Hughes' scheme on the main drainage was the third on the list.

Mr. SCUDAMORE seconded Mr. Hughes' nomination. Mr. Wright had greatly neglected to attend this board; and in the matter of Berkeley House had opposed the economizing efforts of Mr. Leslie.

Mr. WRIGHT, in reply, said in reference to his lecture, he had hired a room, and presented preferential tickets to this board, which had declined to instruct him as to the course he should adopt. It was his intention as soon as the Thames embankment was accomplished to retire from those public duties; at present the great objects in connexion with the Metropolitan Board were—1st, main drainage; 2nd, the improvement of the streets; and, 3rd, to obtain open spaces wherever practicable. He had made up his mind that any kind of deodorization would be imperfect without effective drainage; and in reference to the scheme now being carried out, he had taken an active and prominent part in deciding upon it. If it is a bad scheme he had done wrong. As to the accusation of delay in these matters, the Metropolitan Board had no power to spend money until Lord Derby's Government came into office; and Lord John Manners' Bill was the best thing that could have been done. That bill was not out a month before active measures were taken. He then had stated that the sewerage was so diluted that no one could make any money by deodorizing it; the only chance of doing any good with it was by irrigation. He now reiterated the assertion, believing that no good could be obtained from the deposited sewerage, as had been the experience at Leicester. In reference to a charge of restricting the freedom of any ratepayer to effect alterations, he had advocated and secured a neighbour's claim right and left to have notice of an intended projection. He had been opposed to removing the offices until the board was permanently established—and he would observe that on these subjects Mr. Leslie is frequently wrong. Instead of expending money in tinkering up the old offices in Greek Street, it was the wisest economy to remove to Spring Gardens. Greek Street is not central, and has only one good thoroughfare near it—Oxford Street. Under the agreement with Government a good entrance would be obtained into the park from Charing Cross, the Government providing one-half of the roadway and the Metropolitan Board the other, and which would be accomplished in building the new offices.

Mr. HUGHES made some remarks on the expense entailed on this district for gas and sewers, and complained of the ignorance in which this board was kept as to the appropriation of its moneys. Mr. Wright had ability and opportunity, but he had extremely neglected to inform them of what was going on; and he could not see how he could sit at the Metropolitan Board free and unfettered.

The votes being taken, there were for Mr. Wright, 25; for Mr. Hughes, 6.

Auditors' report of accounts to 25th of March was read, wherein they mentioned the grant for prosecuting the Metropolis Gas Inquiry to be illegal, but considered the same will result in the good of the parish.

Surveyor's report was read, relative to sites where (in his opinion) meters might be fixed for the purpose of testing the consumption of gas by the street lamps. The sites recommended were Smith Street, Knightsbridge, St. Margaret's and St. John's Churches, the Workhouse, the residences of Mr. Hughes and the Surveyor.

Mr. HUGHES said it was proposed to attach meters to a few of the lamps, which might be set to a regulator burning five feet an hour. As the case is now, the gas goes down after twelve o'clock; but by attaching a regulator introduced by Mr. Sugg, they could then detect all deficiences. He proposed "That a Sugg's regulator be attached to a lamp at each of the above places."

Mr. CLARK having seconded, an amendment by Mr. NORRIS was carried for postponing the subject to next week.

A letter was read from the vestry, enclosing a copy of a resolution as to bringing into operation the Metropolis Water Act of 1852.

Mr. HUGHES urged bringing into operation the high-pressure system for a constant supply of water in case of fire. They had been two years asleep on the matter, and were the laughing-stock of the great manufacturing towns, where the high-pressure plan was in use. He suggested that they apply to an eminent hydraulic engineer as to the effect of the high pressure on the pipes, and other particulars as to hose and costs.

Mr. T. HORN said they must first get the votes of four-fifths of the inhabitants, either by advertisements or through the press, before they could apply the Act. In Woolwich, Croydon, &c., it had proved a failure. There was also the objection of a water police, entering private houses, &c.

Mr. HUGHES did not refer to such places as Woolwich and Croydon, but to Manchester, Leeds, Bradford, &c.

The Board then decided that a case be prepared and submitted for consideration with a view to apply the Metropolis Water Act to the district, as to the effect on the householders and the costs. A committee of five gentlemen

were appointed to ascertain on [what terms a constant service in the street mains might be obtained; also the best means and cost of attaching hose and extinguishing pipes, &c.

An Adjourned Meeting of this Board was held on Friday last for the consideration of the report of the special committee of the board appointed on the 20th of April last, to ascertain and report upon the proceedings before a committee of the House of Commons with reference to the metropolitan gas inquiry, &c., and for other purposes.

Mr. ARNTZ, the surveyor, presented his report as to sites where meters might be fixed for the purpose of testing the consumption of gas to the street lamps. He said that the expense of fixing meters and regulators to eight lamps would be £30. The Western Company, he believed, would have no objection to this being done. He could not state the opinion of the Chartered Company, as there had been no formal application made to them.

Mr. HUGHES thought it important that some active steps should be taken in the matter, as the fixing of meters would probably be the means of saving £1000 annually in Westminster alone.

On the motion of Mr. NORRIS, seconded by Mr. MALLOCK, the clerk was directed to send a written application to the gas companies in the district, requesting their permission to the meters being put down.

The following propositions from the committee of the board were then read, the report of the committee itself being taken as read:—That a bill should be prepared, to be based upon the proposals of the gas companies, or upon the resolution of Mr. Jackson, with such alterations and additions as were proposed and insisted upon on behalf of the petitioners. That the preparation of such bill, and the introduction and prosecution thereof through both Houses of Parliament, should be entrusted to, and placed under the entire control and management of the vestries and district boards in the metropolis, contributing rateably, in the first instance, to the expense thereof; or to the assembly of delegates, if reconstructed so as to meet the objection that that body was composed not only of an arbitrary number of delegates from each parish, but of delegates representing parishes who have not contributed to the expense of the investigation. That, in any bill to be introduced into Parliament, care should be taken to provide for payment, not only of the expense of obtaining the Act, but also of the expenses already incurred in prosecuting this inquiry; and that the several parishes to be benefited by such measure should be charged with their fair proportion thereof; and that a copy of the above resolutions of the board, and of the committee's report, be forwarded to each vestry and district board in the city of Westminster, and to other vestries and district boards of the metropolis, with a letter inviting their co-operation in the proposed proceedings.

Mr. NORRIS moved—"That the board do agree with the proposals made by the committee appointed on the 20th of April last, and that a committee be appointed for the purpose of carrying out the said proposals, and report from time to time." He thought it necessary to give the reasons which led to the appointment of the committee. In the first place, no report had been forthcoming from the delegates at the expiration of their year of office. Upon that he had himself moved to know whether any overtures had been made by the gas companies; if any, whether they had been refused; and if so, by whose authority they had been refused. He was given to understand that the delegates had deputed their powers to a board of managers. His resolution had been lost by the delegates themselves appearing against him; but a short time afterwards several gentlemen, considering it of importance that an inquiry should be made and a bill prepared, took the matter up; and a committee was appointed, of which the report signed by himself as chairman had been forwarded to the different members of the board. No information had been obtained from the delegates until after that committee was appointed, and when their report was at last brought in it was not signed. The committee thought it desirable that a bill should be brought in during the present session; and that the best points in the bill proposed by the delegates and that of the gas companies should be taken as a basis.

Mr. HUGHES objected to the indefinite nature of the propositions they were asked to accept. The question was, whether the matter was to be committed to the delegates who had laboured assiduously for the last two years, and who had done their duty to the metropolis, or was it to be taken out of their hands and committed to the vestries and district boards? If so, how many bills were they likely to have? If the proposition had assumed a more definite shape it might be acted upon, but at present he could not tell what was intended.

Mr. T. HORN seconded Mr. Norris's motion. He thought that Marylebone, having promised £100 to the inquiry and afterwards withdrawn it, had no right to question them as to the mode in which they thought it best to proceed. Not a farthing had ever been received from Marylebone, and out of the thirteen or fourteen parishes that had promised to subscribe, not more than four, he believed, had actually done so. He ventured to say that it was impossible to proceed with the inquiry as they were at present constituted. The board of delegates must be broken up; they could then form themselves into a fresh committee, and the question could be fairly gone into.

Mr. MALLOCK thought they were not in a position to proceed. In about six weeks Parliament would be prorogued, and, as the gas companies would no doubt dispute the matter with them, he would ask—What chance was there of getting a bill passed during the present session? He should like to know how many complaints had been made by private consumers, because it was important that they should be properly prepared to prove the preamble of the bill before any steps were taken. He would also like to know how many vestries had subscribed, for, unless a majority of the different boards and parishes were united before they went to Parliament, they would run the risk of not getting a bill at all.

should be consulted before anything was done.

Mr. CLARK repudiated the accusation of Mr. Horn that Marylebone had done nothing. He thought the parish of Marylebone had done a great deal. It was true they had withdrawn the £100 conditionally voted to the metropolitan gas inquiry, but they had ordered it to be expended in experiments for the express purpose of having evidence on the subject to take before Parliament. With regard to other subscriptions they had that morning received an additional £50 from Lambeth, and also an additional £10 from Chelsea. As to the question of to whom the bill should be committed, he could not see what advantage would be gained by the delegates being broken up, and the whole matter being begun again. If this was done, what return would there be for the £100 that Westminster had already expended?

The CHAIRMAN stated that there was now £542 in hand for the purpose of pursuing the inquiry, and therefore he thought it desirable that such a resolution should be agreed to as would bring matters to a point at once.

Mr. HUGHES, in reply to Mr. Mallock, stated that there were numerous complaints of the quality of gas all over London, and of the enormous registration of the meters; and also from Knightsbridge of being compelled to burn the cannel gas of the Western Company.

The CHAIRMAN then proposed the following resolution:—"That this board, having duly considered the report of the committee of the board upon the metropolitan gas inquiry, dated the 6th of May, and the report of the committee of delegates, dated May last, desire to express their opinion that the preparation, introduction, and prosecution of the proposed bill through both Houses of Parliament should be under the control of the delegates representing the parishes who subscribed rateably towards the expenses thereof; and with that view the body of delegates be reconstructed, as suggested in the first-mentioned report."

Mr. EYLES seconded the motion.

Mr. NORRIS said that, as this embraced all that he required, he would withdraw his resolution and adopt the amendment.

The motion having been unanimously adopted, the clerk was requested to send a copy of it to the managers of the metropolitan gas inquiry, with a request that the same should be submitted to the delegates at the earliest opportunity, and that they should be asked to support it.

THE PARIS GAS COMPANY.

REPORT PRESENTED TO THE GENERAL MEETING HELD MARCH 26, 1859.

Gentlemen,—We proceed to render you an account of the working of our undertaking during the year 1858, and to lay before you the debit and credit account of the company up to December 31. This year has been a laborious one, but at the same time it has been profitable, and has given satisfactory indications of the progressive prosperity which we predicted from the commencement.

The increase in the consumption of gas, on which we counted, has not disappointed our expectations. In 1857 we had supplied to consumers 1,845,377,965 cubic feet of gas. The number of our consumers was 34,815. In 1858 the supply of gas was 2,045,148,138 cubic feet; and the number of our consumers was increased to 37,971.

Our receipts for the sale of gas, which in 1857 had been £493,856. 11s. 9d., were in 1858 increased to £548,918. 10s. 5d. Thus the increase shown from one year to the other is as follows, viz.:—In the number of subscribers, 3156, or 9 per cent. In the consumption of gas, 199,770,473 cubic feet, or 10 8-10ths per cent. In the receipts, £55,061. 18s. 8d., or 11 per cent. And on examining the results of the working during the months of January and February of the current year, we find that they indicate an improvement of 13 8-10ths per cent. on 1858.

In addition to the above, the improvements which have been effected in the pipes have greatly diminished the loss of gas.

Although the price of coal in the Northern and Belgian markets has remained the same, and we are still supplied from the same source, we have nevertheless procured our coals at a lower price than was paid in 1857. This saving is accounted for by the fact that the company now effects all its purchases *directly*, and profits by all the advantages accorded to large consumers.

During one portion of the year, the sale of coke continued much below the rate of production. In the month of October a change took place; the sales became more brisk, and the stock of coke resumed its ordinary proportions in most of the works. We have not yet been able to obtain a similar result at the establishment at La Villette, because it is not so conveniently within reach of the Paris market; but it will be enabled, by reason of its connexion with the various lines of railway, to dispose more readily of its coke, and to open markets for it within certain distances. We are organizing a special service for this purpose, and we hope to be able thus to dispose of a considerable portion of our coke beyond the Paris market.

The manufacture of chemical products (in the profits of which the company participates) continues to be carried on with success. On a clear profit of £6774, made within the space of eighteen months, there has been already distributed the sum of £5200, of which the portion due to the company amounts to £3484. The above is not the only advantage derived by the company from this department. The whole cost of purifying the gas being charged to it, the company is thus saved the expense of this process.

The following is an abstract of the working accounts:—

EXPENSES.

Coals distilled, 213,893 chaldrons					£256,137	9 7
Gas in store, brought on from the year 1857					194	3 4
Salaries, expenses of distillation, and general expenses at the stations					44,424	3 2
Maintenance of the works, furnaces, and retorts, pipes, and apparatus					33,155	12 4
Maintenance of meters					4,000	0 0
Expenses of the central establishment					21,042	5 0
Municipal charges, viz.:—						
Duty on coals	£1,488	15 7				
Duty on gas	35,008	8 1				
Rent payable for use of sub-soil	8,000	0 0				
			£44,497	3 8		
Charges incidental to the lighting of the city and maintenance of the lamps, &c., and loss on the allowance given in the tariff of charges			8,762	10 5		
					53,259	14 1
Taxes and subventions					3,377	9 9
General expenses					11,058	11 8
Interest on debenture capital					23,478	17 4
Heating service					940	17 1
Benefit-fund					863	12 6
Contingencies					7,000	0 0
Total expenses					£458,932	15 10

INCOME.

2,045,130,483 cubic feet of gas supplied to consumers	£548,918	10 6	
Coke, after deducting the quantity consumed as fuel	105,770	12 10	
Tar	18,593	14 9	
Gas in store on Dec. 31, 1858	193	9 7	
Surplus in the allowance for maintenance of services and burners	50	2 7	
Rent of services and meters	14,612	11 11	
Discounts and allowances	1,551	15 3	
Profit from the fire-brick works, cartage, and sundry works	10,296	7 4	
Profit from the manufacture of chemical products	3,484	0 0	
Total income			£703,471 4 9
The excess of income over the expenses thus amounts to			£244,538 8 11

Out of this sum we have declared a first di-

vidend of 16s. per (£20) share, which was paid on Oct. 6, amounting to	£88,000	0	0			
And we have, in compliance with the statutes, carried to the reserve the sum of	4,631	11	7			
Making together				92,631	11	7
The remaining profit up to Dec. 31 is thus reduced to				151,906	17	4
We propose to declare the dividend on the account for 1858 at £2 per (£20) share, say	£220,000	0	0			
Deducting from this sum the dividend of 16s. per share paid on Oct. 6, say	88,000	0	0			
The supplementary dividend to be paid on April 6 next will be 24s. per share, say	£132,000	0	0			
And the sum to be carried to the reserve-fund	6,947	7	4			
				138,947	7	4
Balance to be carried forward to the account for 1859				£ 12,959	10	0

These results, gentlemen, give ample proof of the prosperity of our undertaking, and assure us of a successful future if we only persevere in the system of prudence, economy, and progressive improvement which your directors have rigidly adhered to. In truth, the success of our trade has carried our expenses at starting beyond the limits originally laid down, but part of these expenses (which were not contained in our original calculations) was devoted to incidental works, useful as well as productive, such as the fixing and maintenance of services and meters, the works for fire-brick making, and for chemical products. These expenses have also been incurred in the acquisition of plant: in fine, it must not be forgotten that the discount upon our debentures at the time of their issue left a void of £38,357 in our ways and means.

In our report to the general meeting held on the 27th of December, we informed you of the advanced state of our works at the establishments of Villette, Passy, Vaugirard, and Ivry; we described the development we thought it advisable to introduce in the distributing-mains in Paris, and also in the suburbs, and the improvements effected in consequence of the requirements of the service. At that time we could only foreshadow the fresh outlay required by these works; we now submit to you an account of them:—

On the 31st of December, 1857, the capital account of the original establishment amounted to				£2,673,069	12	11
In the account for 1858 this amount was increased by the undermentioned sums, viz.:—						
Construction at the works				114,478	0	3
Pipes				16,861	19	7
Branch services				10,302	16	4
Meters				9,422	4	9
Purchase of works and contract for lighting the Hôtel des Invalides				1,240	0	0
Purchase of landed property				5,396	2	0
Discount on 21,714 bonds, according to resolution of general meeting held on the 29th of March, 1858				13,057	0	0
Thus, the sum total of our invested capital, on Dec. 31, amounted to				£2,843,827	15	10
Apportioned as follows:—						
1. Original capital, comprising amount of shares and original expenses				£2,113,659	11	8
2. Landed property purchased since the formation of the company				108,406	10	10
3. Erection of works at La Villette, Passy, Vaugirard, and Ivry				453,268	12	4
4. Pipes				65,523	10	6
5. Branch services and meters, to be let on hire				97,224	12	10
6. Plant for the transport of materials				5,744	17	8
				£2,843,827	15	10

On the other hand, in compliance with your resolution of the 29th of March, 1858, we have issued the 25,300 bonds which you voted, and the produce of which (their price having been fixed at £16. 8s.) has been £414,920.

Thus, gentlemen, the sum total of our original expenses being fixed at				£2,843,827	15	11
These expenses are only just covered by our capital, viz.:—						
In shares	£2,200,000	0	0			
In bonds	414,920	0	0			
				2,614,920	0	0
Leaving an excess, to be covered by a fresh issue of capital, of				£228,907	15	11

An unforeseen cause has called for a much larger development of our means of production. Under the regulations of the old companies, and according to the practice of lighting by the hour, the winter consumption only exceeded that of the summer in proportion to the decrease in daylight. Now, these proportions are not preserved: the almost entire suppression of lighting by the hour has produced a considerable increase in the difference between the summer and winter consumptions. Our total daily supply of gas for 1858 was, on the average, 5,473,050 cubic feet. Now, in the last week in December, we have supplied, and there have been consumed, 9,992,730 cubic feet per diem! The increase in the difference is thus nearly doubled. You perceive, gentlemen, what powers of production we have therefore had to provide for in our works. Another cause of increase in the expenses is to be found in the distance which separates all our establishments from the centre of consumption, and the consequent necessity of increasing the number of large-sized pipes.

It was impossible to foresee all these additional expenses; they could only be ascertained by experience; still, as they are confined entirely to the requirements of the works, we must, as we have elsewhere remarked, consider them as proof of the prosperity of our undertaking. The continually improving results of our labours clearly indicate their utility. In fact, these expenses are only rendered necessary by the simple fact of increase in the consumption. We can only congratulate ourselves upon an increase of capital resulting from a constant increase in our returns. It is for this reason that railway companies, when enlarging their stations and adding to their stock in order to meet the demands of a constantly increasing traffic, congratulate themselves on the necessity.

We should not forget, moreover, that whilst our contract confers on us the privilege of supplying Paris with gas, it also imposes on us the necessity of maintaining the production in an equal ratio with the consumption, so that we may be always in a position to supply all wants and all demands to an unlimited extent. These demands, as our results show, are constantly on the increase. Thence it becomes necessary that the company should increase its capital, not only to cover expenses already incurred, but rather to develop its manufacture in proportion to the present and anticipated consumption. It is on these grounds, and in the firm expectation of being called on to provide for a fortunate necessity, that, with an increase of 25 per cent. in three years in our consumption, we applied ourselves to the study of the means of placing our manufacture within range of the probable demands up to 1861; but since this meeting was called, the Imperial decree relating to the extension of the boundaries of Paris has been promulgated. The measure which forms the subject of this decree appearing to us to call for an essential modification of our contract with the city, and perhaps also the adoption of new financial arrangements, we shall at present confine our demands to a credit sufficient for our actual requirements.

As regards the measure itself, its consequences, and its probable effects, we are left in complete security. With our concessionary contract, reciprocal as it is in its character, and confirmed by the Imperial sanction, and having the force of law, we need not fear that the extension of the limits of Paris should operate to our prejudice. We have, nevertheless, entered upon the inquiry, in order to register our reservations; but the projects of the Government with reference to the pipes and the lighting of the annexed district are not yet sufficiently known to us to enable us to form a correct idea of the total cost. When the fate of this measure shall be determined, we will submit to the municipal authorities such propositions as will appear to us likely to conciliate them, by preserving equally the convenience of the city and the interests of the company. The agreement which may be arrived at will only be subscribed to by us, subject to your approval; and when we submit it to you, we shall propose the ways and means of its execution.

Our company is established to perform at once both the lighting and warming by gas of the city of Paris, and of the communes in the suburbs. The greater part of the communes in the district about to be annexed to the city, betweeen the *octroi* wall and the fortifications, are already lighted by the Paris Company. Still two other companies continue to supply gas in some communes of the suburbs.

One of these companies, the Eastern, supplies the communes of St. Mandé, Vincennes, Berey, Charonne, &c., and the terminus of the Lyons railway.

The other company, the Northern, lights the communes of Batignolles, Monceaux, Montmartre, La Chappelle St. Denis, the town of St. Denis, Clichy, St. Ouën, and the terminus of the Western railways.

Looking at possible contingencies, it may be essential to our interests to treat with these two companies.

For this purpose, we require full and unrestricted powers to enable us to form such a combination as will be most favourable to our company. We now ask these powers of you. You may rely on the zeal and devotion of your board of directors to conduct these negotiations in the manner best suited to the furtherance of your rights.

From the accounts laid before you, you perceive that the excess of our expenditure is £232,907. 15s. 11d.

We ask of you a credit of £240,000, which we shall use only as required.

Our landed property in Paris would have furnished us with this assistance, could it have been realized immediately; but the moment is not favourable for their sale. We acquainted you in December last with the motives which induced us to refrain from pressing them. It is necessary to preserve to the company the profit of the increased value which will be imparted to these properties by the projects of new streets and other improvements decreed by the municipal authorities.

We are now soliciting an official communication of the plan for laying out the public streets, to which the arrangement of our districts must be subordinate. Until we have obtained this, no sale can take place under favourable conditions. For the present, therefore, we must not count on the proceeds of their realization.

The benefit-fund of the establishment of which we have informed you, and with the object and resources of which you are acquainted, has been in regular operation since the month of May last. Its results give satisfactory proof of its utility. But it was not enough to provide for temporary wants and sufferings. After the example of most large companies established for a long period, we have thought it necessary to provide a fund, the object of which would be to afford retiring pensions to such servants of the company as have grown old in their employment.

There is no need for us to justify the adoption of this protective measure, which is permitted, and in some degree enjoined by the prosperity of the company; and the effect of which will be to encourage the devotion of those employed, and to attach them more closely to our interest. The fund for the retiring pensions will be formed by an annual per centage on the gross receipts of the company, and also by donations and bequests which may come in to enlarge it. The retiring pension will only be allowed to such *employés* of the company as are at least 55 years of age, and have been for 25 years actively employed in their service. Calculation and experience prove, that for a staff like that of the company, an annuity of £1120, placed at 5 per cent. compound interest for 25 years, is sufficient to furnish, not only such pensions as will be due at the close of that period, but also such exceptional pensions as may be granted before that time. A donation of 100 of the company's bonds, producing £100 interest, has already been made with a view of contributing to the foundation of this fund. The endowment of the company will therefore be reduced to an annuity of £1020. We hope, gentlemen, that you will see fit to approve this measure, and to vote the endowment proposed.

We have finished, gentlemen, the communications we had to make to you on the progress of our undertaking, and the results for the year 1858. The accounts submitted to you have been verified by the committee to whom you entrusted this duty. You will receive their report. Our profits have reached an amount which shows that the present conditions of our business ensure a large return to the capital already engaged, and to that which will yet be required by the development of our trade. We must not lose sight of the circumstance, that by far the greater portion of our expenditure at the outset was owing to the removal of the three establishments which then existed in Paris, which removal formed one of the conditions of our contract. Now, this outlay not having for its object the construction of a new system, but merely the reconstruction of one which had been suppressed, was unproductive, and served only to rebuild, outside Paris, the works which had been destroyed within its bounds. This removal has been to the company a sacrifice, the weight of which has pressed heavily on its first few years. But this sacrifice, which was imposed on us by the municipal authorities as a condition of our concession, is now completed; and we shall henceforth have to add to the amount of our invested capital only such expenditure as will be both useful and remunerative. Expenses of this nature the company neither can nor ought to avoid, for they are the source of its prosperity.

CURIOUS BEQUEST TO THE IMPERIAL GAS COMPANY.—At the weekly meeting of the directors and guardians of the poor of Marylebone on Friday, it was announced that Mr. William Kensett, the well-known Marylebone reformer, and who died of cholera in Paris some three or four years since, had left by will a sum of twenty guineas each to the Marylebone Almshouses and the Christ Church National and Infant Schools, which had been paid to those institutions. The following extraordinary request was also made in his will:—In the first place, that his body should be given up to one of the medical schools of the metropolis for dissection, and that his bones and remains should then be handed over to the Imperial Gas Company, to which company, on condition that they consumed them in one of their retorts, he is stated to have bequeathed the sum of £10.

BANKRUPTCY OF DR. J. J. W. WATSON.—The *Gazette* of the 14th inst. contains a notice of the bankruptcy of this individual, well known as the founder of the Electric Power, Light, and Colour Company, but recently carrying on some colliery operations in the Forest of Dean, which have been unsuccessful.

EXPLOSION OF A GAS-METER AT ST. PAUL'S CATHEDRAL.—On Saturday afternoon an explosion of gas took place at St. Paul's Cathedral, but it was fortunately unattended with serious consequences. A workman was engaged in the crypt beneath the dome of the cathedral in some operation connected with the large meter placed there for regulating the supply of gas during the late special services, when, from a cause which is unexplained, an explosion took place, by the force of which the thick metal plates of which the front of the meter was composed were rent in pieces, and some of them hurled to a considerable distance. A solid timber bench, used by the carpenters in the employ of the cathedral authorities, was shivered to pieces, and a kind of shield for the index of the meter was broken into matchwood. Happily the whole of the workmen, with the exception of the man referred to, were at dinner at the time of the occurrence, or the result must have been of a most fearful character. The man who was engaged upon the meter at the time of the explosion was behind the instrument, which remained firm in its place, no portion of the back plates having started. The report of the explosion excited great alarm at the moment in the building, but this we are glad to state was the extent of the mischief.

Price Current.

CASTINGS, PER TON.

Average Weight of Cast-Iron Gas-Pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle.	Wales.	Yorkshire, Derbyshire, and Staffordsh.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pig Iron, No. 1	3 10 0	2 7 6	2 15 0	3 0 0	3 5 0
1½ and 2 inches Socket-Pipes	7 0 0	6 0 0	6 5 0	6 10 0	6 15 0
2½ and 3 „ „	6 10 0	5 10 0	5 15 0	6 0 0	6 5 0
4 and 5 „ „	6 0 0	5 0 0	5 5 0	5 10 0	5 15 0
6 in. and upwards „	5 15 0	4 15 0	5 0 0	5 5 0	5 10 0
Retorts, 1st fusion, hot blast	5 10 0	4 10 0	4 15 0	5 0 0	5 5 0
„ 2nd „ cold „	6 10 0	5 5 0	5 10 0	6 0 0	6 5 0
Tank Plates, ⅜ thick and above	6 0 0	5 0 0	5 5 0	5 10 0	5 10 0

WROUGHT-IRON TUBING,

Subject to 40 per cent. Discount.

	¾ in.	1 in.	1¼ in.	1½ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 ft., perft.	1 8	1 0	0 10	0 7	0 5	0 4½	
„ „ „ 6 in. to 18 in., each	3 0	2 0	1 9	1 3	1 0	0 9	
Connecting-Pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11	
Bends, Springs, and Elbows—wrought iron	3 9	2 3	1 9	1 0	0 10	0 8	
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10	
Crosses, wrought or cast	4 6	3 0	2 6	2 0	1 6	1 2	
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6	
„ with brass plug	28 0	16 0	13 0	7 0	5 6	4 6	
Diminishing Sockets, Caps, Plugs, and Plain Sockets	1 3	0 9	0 8	0 6	0 5	0 4	
Syphons, 2 quart	1 0	0 8	0 7	0 5	0 4	0 3	
	15 0	14 0	13 6	13 0	12 0	—	

COALS, PER TON.

Newcastle.—Unscreened.		*Scotch Cannel.*	
Whitwell Primrose	6s. 3d.	Boghead, at Leith	40s. 0d.
Medomsley, Eighton Moor, and Burnhope	6 6	Kirkness, best	23 0
Pelaw	6 9	Capeldrae, 1st quality	20 0
New Pelton, Peareth, South Pelaw, Washington Hutton, and South Peareth	7 0	„ 2nd „	12 6
Pelton	7 9	Lesmahago, at Glasgow	25 0
Ramsay's Newcastle Cannel	16 0	„ „ Leith	27 6
		Arniston	22 0
		Wemyss	20 0
		Knightswood	18 0
		Pirnie	15 0

SUNDRIES.

Best Newcastle Fire-bricks	per 1000	50s. 0d.	
Cliff's Fire-bricks, at Wortley	per 1000	57 6	
Ingham's Fire-bricks, at Wortley	„	55 0	
Fire-clay Retorts	per foot run, 3s. 6d. to	7 0	
Tough Cake Copper ... per ton	£107 10s.	Foreign Spelter ... per ton	£19 2 6
English Pig Lead ... „	23 0	English Block Tin ... „	125 0 0
Welch Bar Iron, in London „	7 0	Banca ... „	132 0 0
Tarred Rope Yarn	per cwt.	28s. 0d.	

FREIGHTS.

Coastwise—Newcastle.—Per Ton.		*Foreign.—Per Keel.*	
Chatham & Rochester	6s. 9d.	Boulogne and Calais	£8 10
Cork	—	Barcelona	29 0
Dover	7 6	Bordeaux	17 10
Dublin	—	Cadiz	20 0
Exeter Quay	9 6	Copenhagen	9 0
Folkestone	7 6	Dieppe	12 0
Hastings	—	Genoa	28 0
London (Pool)	6 9	Hamburg	£8 15 to 9 0
Lowestoft & Yarmouth	5s. to 5 3	Havre	11 10
Lynn	—	Leghorn	28 0
Portsmouth	8 9	Lisbon	20 0
Plymouth	—	Rotterdam	8 10
Whitstable	7 0	Stettin	11 0
Weymouth	9 3	Trieste & Venice	—

Advertisements.

FIRE-CLAY RETORTS.

JOHN SWARBRICK,

MANUFACTURER OF PATENT COMPOSITION CLAY RETORTS,

FIRE BRICKS OF EVERY DESCRIPTION, SHAPE, AND SIZE, &c. &c.

HIGHER EANAM, BLACKBURN, LANCASHIRE.

These RETORTS are generally used in the Gas-works of Preston, Accrington, Bury, Heywood, Middleton, Rochdale, Ratcliffe; the Mills of Messrs. Horrocks, Miller, and Co., Preston, &c. &c., and are unequalled in having afforded general satisfaction to those who have given these Retorts a trial.

To meet the increasing demand, the Works at Little Harwood have been greatly enlarged; and Gas Engineers who may favour with an Order may rely with confidence on their being promptly supplied with an article not to be surpassed in finish or durability.

PRICES MODERATE.

WROUGHT-IRON TUBING.

MACLAREN, WRIGHT & CO.,

MANUFACTURERS OF

WROUGHT-IRON TUBING, FITTINGS, ETC.,

FOR GAS, WATER, AND STEAM.

GLOBE TUBE WORKS,

35, M'ALPINE STREET, GLASGOW.

Export Orders shipped from Glasgow and London.

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PATENT CAST-IRON PIPES.

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IRON-FOUNDERS, GAS ENGINEERS,

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PATENT CAST-IRON PIPE

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AND EVERY DESCRIPTION OF

TUBULAR GLAZED SEWERAGE PIPES, BENDS, JUNCTIONS ETC.

FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS.

TO GAS COMPANIES.

THE Advertiser (28 years of age) having had over 13 years' practical experience in planning erecting, and managing works, with Clay and Iron Retorts, on the most economical principles, as also the laying of Mains and Services, in short everything incidental to the formation and management of Gas-Works, is now open to an ENGAGEMENT either at home or abroad. The most satisfactory Testimonials as to character and abilities can be given.

Address Scotland, care of W. B. KING, 11, Bolt Court, Fleet Street, LONDON.

June 11, 1859.

WANTED, a Situation as Assistant CLERK in a Gas-Work, by a young man who has a thorough knowledge of French and English, and understands German. The most satisfactory references will be given.

For particulars apply to the MANAGER of the Gas-Works, JERSEY.

COKE FOR SALE.

THE best Coke is now selling at the OXFORD GAS-WORKS at Ten Shillings per Ton.

FOR SALE, twelve second-hand Con- DENSER-BENDS, FLANGED **T** PIECES, and various other CONNEXIONS, useful for a small Gas-Work. They consist of three 12-inch **D** Mouth-pieces, seven Flanged Crosses with Bonnets, twelve Bends for 4-inch Condenser, top and bottom Bends, Syphons, &c.

The whole will be sold upon reasonable terms, which may be had upon application to MR. GEO. BERRY, Gas-Works, Ashford, KENT.

MR. JOHN HODGSON JONES, CIVIL ENGINEER,
Has removed his Offices from 1, Poet's Corner, to 26, GREAT GEORGE STREET, WESTMINSTER, S.W.

TO GAS COMPANIES AND OTHERS.

WANTED, a second-hand Gasholder to contain from 20,000 to 25,000 cubic feet of Gas, with Cast-Iron Tank, Columns, and Girders complete.

Particulars and price to be sent to Mr. EDWARD WATTS, Solicitor, HYTHE, the Secretary to the Hythe and Sandgate Gas Company.

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THE Advertiser, who is practically acquainted with the Manufacture and Distribution of Gas, Retort Setting, Main and Service Laying, Fitting, Rectifying of Meters, and the whole routine of a country establishment, is open to an Engagement as MANAGER of Gas-Works. Salary about £70 per year. Is also qualified as Secretary or Collector. Security can be produced, likewise references and testimonials of character and ability as Gas Manager.

Address C. U., care of Mr. W. B. KING, 11, Bolt Court, Fleet Street, LONDON, E.C.

PURIFIERS AND SCRUBBER FOR SALE.

TO be Sold, four Dry-Lime Purifiers, 6 feet square by 3 feet 6 inches deep, arranged for 4 tiers of Sieves, with Covers, &c, complete.

A CENTRE HYDRAULIC VALVE, arranged for four Purifiers, with 9-inch connexions.

Also a SCRUBBER, with 9-inch connexions, the whole in good condition.

Apply to Mr. BOWEN, Gas-Works, CARDIFF.

ON SALE, Two Station-Meters, in Round Cast-Iron Cases, made by Parkinson and Co. in 1847, to pass 10,000 cubic feet of Gas per Hour, and now at work at the Gas-Works, Leicester. Price £40 each net.

Further particulars may be obtained on applying to H. M. ROBINSON, Esq., Gas Office, LEICESTER; or to WEST and GREGSON, OLDHAM.

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THE MACHEN COLLIERY COMPANY, NEWPORT (MON.).

Shippers of Fire-Goods of First-class quality manufactured from a remarkably pure seam of Fire-Clay.

Railway Communication by Broad or Narrow Gauge with all parts of the Kingdom, and by Seaboard, Coastwise, and Foreign.

EIGHTON MOOR GAS COALS.—Parties wishing to be supplied with these first-class Gas Coals will please to apply to Mr. MATTHEW NESBIT, EIGHTON MOOR OFFICE, NEWCASTLE-UPON-TYNE. These coals are well known as among the richest in gas, and working the roundest on the River Tyne. They are extensively used by metropolitan gas works.

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PATENTEE and MANUFACTURER of all kinds of Apparatus for Cooking, Heating Baths, Conservatories, &c., by Gas, and general Gas-Fitter by Appointment.

WILLIAM SUGG,
GAS ENGINEER,
AND GENERAL
GAS APPARATUS MANUFACTURER,
19 & 20, MARSHAM STREET, WESTMINSTER.

WATER and DRY GAS METERS, with all the latest improvements.
Improved GOVERNORS of all kinds.
STATION-METERS of first-class quality.
PHOTOMETERS, PRESSURE-GAUGES, TEST-METERS, GASHOLDERS, &c.
GOVERNORS for Street Lamps, 36s. per dozen.
STREET-LAMP LAVA BURNERS, cased in Brass, 24s. per gross—to burn 2½, 3½, 4, and 5 feet per hour.
Argand, Sun-Ring, Photometer, and all kinds of Burners in Lava.

THE PURIFYING-HOUSE SUPERSEDED.

MR. LAMING (Inventor of the Revivified Oxide of Iron Purification) has the satisfaction to announce that Gas may now be purified in a manner that combines unusual commercial advantages with all the possible requirements of the sanitary officer and the public. All that need be said to call attention to the new process is, that instead of the purifying-house, two vessels of small area, placed after the condenser, suffice; that these vessels never have the least communication with the atmosphere; and that neither lime, oxide, nor any other substance foreign to the gas itself is brought into contact with it. Gas engineers will perceive among the advantages thus offered, economy in room, labour, and materials; impossibility of nuisance; and total absence of injury to the illuminating power.

Particulars by addressing RICHARD LAMING, 118, FENCHURCH STREET.

WROUGHT-IRON Guides for Gas- holders.—Designs and Working Drawings for Trussed Wrought-Iron Guides and Frames can be obtained of CHARLES DIXON, C. E., Chichester, SUSSEX.

KINSON FIRE BRICKS are inde- structible by heat, and are warranted to last twice as long as Stourbridge, Newcastle, or Welsh bricks. 80s. per 1000 at Nine Elms Station.
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NEWCASTLE-ON-TYNE & MIDDLESBRO'-ON-TEES.
Wrought and Cast Iron Pipes, Cast-Iron Retorts, and all kinds of Foundry Work necessary for Gas-Works. Fire-Bricks and Clay Retorts. Gas Coals of every description. Pig, Bar, and Plate Iron.

ADDISON POTTER,
WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE,
Manufacturer of Clay Retorts, Fire Bricks, and every description of Fire Clay Goods.

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ENGINEERS & METER-MAKERS,
CRAWFORD PASSAGE, RAY STREET,
CLERKENWELL, LONDON (E. C.).
Manufacturers of Station and Patent Protector Consumers' Meters, Patent Slide-Valves, Gas-Fittings, Pipes, &c.
Also, High-pressure Cocks, Hydrants, Closets, and all Water-Fittings.

WILLIAM STEPHENSON & SONS,
THROCKLEY,
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MANUFACTURERS OF EVERY DESCRIPTION OF
FIRE BRICKS, CLAY RETORTS, LUMPS, TILES,
&c. &c.
LONDON OFFICES:
76, KING WILLIAM STREET, CITY.
A large stock of Fire-Clay Goods always on hand in London, at the lowest wharf prices, at Messrs. CHRISTIE & Co.'s Wharf, 64, Bankside, SOUTHWARK.

LESMAHAGO GAS COAL.

JAMES FERGUSON and CO., Lessees of the Auchinheath and Craignethan Gas Coal-fields (the most extensive and valuable in the parish of Lesmahago), respectfully intimate to the Managers of Gas-Works and Consumers of Gas Coal, that he is prepared to ship the best quality of the above well-known COALS at Glasgow or Leith; and also to deliver them at the railway stations upon, or connected with, the Caledonian Railway, to any extent which may be required.

Price, free on board, or delivered at the railway stations, may be learned by addressing James Ferguson and Co., Gas-Coal Works, Lesmahago.

Shipping Agent for Glasgow:
MR. ALEXANDER STRATTON,
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BENJAMIN GIBBONS, Jun., DEEPDALE FIRE-CLAY & BRICK WORKS,
Near DUDLEY,
Manufacturer of every description of Fire-Bricks, Lumps, Quarries, Shields, Flue Covers, &c., to any size or shape required.

FIRE-CLAY RETORTS,
TO MODEL OR DRAWING.

B. G. begs to call the attention of Gas Companies to his Fire-Clay Retorts, which have been used with great satisfaction in some of the largest Gas-Works in the Metropolis and many Provincial Towns in England.
References given, if required.

ROBERT MACLAREN and CO., EGLINTON FOUNDRY, GLASGOW,
Manufacturers of all sizes of Cast-Iron Main Pipes, by an improved Patent. General Ironfounders, Gas Engineers, and Wrought-Iron Tube Makers.

CAST-IRON Retorts, Socket Pipes, with Syphons and all requisite Connexions, Lamp Columns, Wrought Iron Tubing, Valves, Street Lamps, Sight Holes, Furnace Doors, Ash Pans, Charging and Coke Shovels, Iron Pails and Coke Barrows, Cross Bars, Fire Pots, Pumps, Iron Borings.

PURIFIERS, CONDENSERS, and SCRUBBERS erected complete, or the materials supplied; with every description of goods in use by Gas-Works, in stock, on wholesale prices, at
LYNCH WHITE'S,
Old Barge Iron Wharf, Upper Ground Street,
LONDON.

J. W. GRAZEBROOK, 75, Old BROAD STREET, LONDON,
Having applications for New and Second-hand Gas Apparatus, would be obliged by those Companies having Apparatus to dispose of, to send particulars. And Companies requiring Apparatus are solicited to apply.
PIPES, RETORTS, TANKS, GASHOLDERS, &c. on Shortest Notice.
STOURBRIDGE and NEWCASTLE FIRE GOODS.
CONTRACTS TAKEN.

WM. RICHARDSON and CO.,
SPRING GARDEN IRON-WORKS,
DUDLEY, near BIRMINGHAM,
Manufacturers of Gas Apparatus in all its branches.
A large assortment of New and Second-hand Gas Apparatus constantly for Sale.
Gas Apparatus Enlarged and Exchanged.

EDWIN DIXON,
WOLVERHAMPTON PATENT WROUGHT-IRON TUBE WORKS,
Originally established in 1833,
Manufacturer of Gas and other Tubes, Fittings, and articles of every description belonging to Gas, Water, or Steam.
E. D. had the honour of receiving the
PRIZE MEDAL
awarded to this Manufacture by the COUNCIL of the GREAT ENGLISH EXHIBITION of 1851; and from the latter date has supplied many towns exclusively with GALVANIZED and other Tubes for Gas and Water, under GOVERNMENT ENGINEERS.
A City, containing 150,000 inhabitants, has recently been entirely supplied with Tubes made at the above-named Works, and several others with populations nearly as great; in fact, the reputation now acquired induces this notice to the public.
Large Stocks generally on hand, averaging from one to three hundred thousand feet.
HYDRAULIC PRESS TUBES, to resist 6000 lbs. and upwards to the square inch, extensively manufactured.
STOCK DIES and SCREWING TACKLE, of the best possible description.
Every Tube carefully tested with Hydraulic Pressure before leaving the Works.

WILLIAM PARKINSON AND CO.,
(SUCCESSORS TO THE LATE SAMUEL CROSLEY,)
COTTAGE LANE, CITY ROAD LONDON,
Beg to announce that, in addition to the Manufacture of
GAS-METERS,
they continue the Manufacture of
METERS FOR MEASURING WATER, SPIRITS, &c.,
commenced, under Patent in 1849, by the late Mr. William Parkinson.

These Meters are as simple and durable as the Gas-Meter, and as correct as that instrument in the registration of the fluids passing through them.

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VOL. VII. of the JOURNAL of GAS LIGHTING, WATER SUPPLY, and SANITARY IMPROVEMENT, for 1858, price 21s., bound in cloth and lettered. A few copies of Vols. II., III., IV., V. and VI. are still on sale.

W. B. KING, 11, Bolt Court, Fleet Street.

THE GREAT CENTRAL GAS CONSUMERS' COMPANY.

Just Published,

A FULL Report of the Proceedings on the ARBITRATION between A. A. CROLL, Esq., and the GREAT CENTRAL GAS CONSUMERS' COMPANY. Before C. MAY, Esq., C.E., F.R.S., and THOMAS G. BARLOW, Esq., C.E., Arbitrators, and C. HOGGINS, Esq., Q.C., Umpire.

Reprinted from the *Journal of Gas Lighting, Water Supply, and Sanitary Improvement.*

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GASHOLDER FOR SALE.

TO be Sold, a bargain, a Gasholder, which will contain about 15,000 cubic feet of Gas, with CAST-IRON TANK, COLUMNS, GIRDERS, &c., all in excellent condition, and may be seen in use at the Equitable Gas Company's Works, Thames Bank, Pimlico, and particulars obtained on application to the SECRETARY, at the Company's Office, No. 21, John Street, Adelphi, LONDON.

FOR SALE, several lengths of Hy- DRAULIC MAIN, 14 inches diameter and 6 feet 9 inches long, with 7 holes for Dip-Pipes.

Also, 4-inch ASCENSION-PIPES, 3-inch ARCH and DIP PIPES, and D MOUTHPIECES, all in excellent condition, and will be sold at a very low price.

To be seen on application to the STOREKEEPER, at the Equitable Gas Company's Works, Lupus Street, PIMLICO.

WILLIAM RYDER, General MINERAL AND METAL AGENT AND MERCHANT, 4, DEAN STREET, NEWCASTLE-ON-TYNE,

is prepared to supply Gas and Water Companies with Apparatus and Appliances of every description, including Cast and Wrought Iron Goods, Coals, Fire-Bricks, Retorts, &c. &c.

Any communications addressed to him as above shall have prompt attention.

M. SHEEN, Gas and Railway Lantern Maker, 90½, Holborn Hill, begs to inform Managers of Gas-Works, &c., that she continues to contract and supply Lanterns on reasonable terms, and keep them in repair by the year.

WHITEHOUSE and CO., Boiler and GASHOLDER MAKERS,

GLOBE PATENT TUBE WORKS, WEDNESBURY,

Beg to draw the attention of Engineers and Managers of Gas Works to the superior quality of the Article they manufacture, both in respect of the iron employed, and the perfect manner in which it is welded; in proof of which they can refer to the testimonials of the most eminent Gas Engineers, and the experience of the principal of the large Gas Companies of the kingdom.

Orders promptly executed.

By Royal Letters Patent.

KAY'S Patent Equitable Gas-Meter is the most effective preventive of fraud by "tilting," and is as simple in construction as the common meter.

Manufactured only by

W. COWAN,

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AND

COMMERCIAL CHAMBERS, RIDINGS COURT, ST. MARY'S GATE, MANCHESTER.

J. CLIFF'S Fire Bricks, Clay RETORTS, &c.

Orders for London and South of England to be addressed to Mr. NEWTON, Agent for the District, 16, Castle Terrace, New Hampstead Road, KENTISH TOWN, N.W.

N.B.—A few Retorts of each size, and a large stock of Bricks and Lumps, always on hand at the above Wharf.

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DIRECT-ACTING GAS-EXHAUSTERS,

supplied either with or without Steam-Engines and Boilers.

FOUR-WAY DIAPHRAGM VALVES,

one of which answers the purpose of THREE ordinary Valves, as applied to Purifiers, or in shutting off and passing Station-Meters, Governors, or other apparatus, while the Connecting-Pipes are also much simplified.

RETORT SETTINGS,

designed to be heated by Tar alone, and with a total absence of Smoke.

Illustrated circulars, giving references and every information, may be obtained on application as above.

WALTER MABON, Engineer, ARDWICK IRON WORKS, FAIRFIELD STREET MANCHESTER,

Manufacturer of

IRON TANKS for Gasholders, Railway Stations, &c.

GASHOLDERS.—Extensive premises at Gorton, solely for the manufacture of Gasholders, and other heavy Wrought-Iron Structures.

GAS APPARATUS.—W. M. has an extensive assortment of patterns for Purifiers from 4 feet to 15 feet square, also round ones from 4 feet to 10 feet diameter; Scrubbers, Condensers, Washers, Columns, Girders, and Tripod Patterns, suitable for Gasholders, from 10 feet to 150 feet diameter, either Single-lift or Telescope. Contractor for Gas Works of any Magnitude. Designs, Specifications, and Estimates furnished.

WROUGHT and CAST IRON ROOFS for Railway Stations, Gas Works, Warehouses, and Sheds, prepared for Slates or for Corrugated Iron.

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PIPES and VALVES, for Gas and Water, from 2 inches to 48 inches bore.

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CANNEL AND COAL FOR GAS PURPOSES.—Fifteen years' connexion with one of the largest Gas Concerns in England, enables us from practical experience to certify that the CANNEL and COAL we offer are those best suited for Gas purposes.

On application, we shall have much pleasure in forwarding our Tabulated Statements of Analyses, with Prices and Terms; also References as to respectability.

All Contract Orders have our careful and best attention.

EMANUEL TURNER and Co., Exporters of Cannel and Coal, 34, Castle Street, LIVERPOOL.

WEST and GREGSON, Gas-Meter MANUFACTURERS, &c. UNION STREET, OLDHAM.

Station and Experimental Meters, Gas Pressure Registers, Gauges, Experimental Gasholders, Governors, Slide Valves, &c. &c.

W. and G. would respectfully call the attention of Gas Engineers and Managers to their Station-meters, having made and erected the largest in use at the present time, two of which may be seen at the Stockport and Liverpool Gas Works, on application to the respective Engineers.

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Capital, £50,000 (with power to increase).

In 10,000 Shares of £5 each; Deposit, £1 per Share.

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Established for the purpose of lighting provincial districts of 2000 inhabitants and upwards.

The Company is in possession of several works, producing a valuable and increasing rental, and the Directors are prepared to purchase or erect works in localities where the consumers are willing to contribute a proportion of the necessary capital by subscribing for shares in the undertaking.

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R. S. PARKER, Secretary.

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DRY GAS-METERS,

Of which upwards of 24,000 are at present in use, having gained for themselves an unparalleled patronage from all the principal Gas Companies and Consumers, on account of their unerring registration and the superior workmanship and materials used in their construction, enables the Patentee to sell them now at competitive prices with those of other makers.

Every description of Improved Wet or Patent Dry Meters and Gas Apparatus manufactured by

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28, BAGNIGGE WELLS ROAD, CLERKENWELL.

THE UNIVERSAL

GAS-BURNERS REGULATOR,

(GEYELIN'S PATENT,)

The only one in the world by which the flame from Argand, Fish-tail, and all other Burners remain invariable under all variations of pressure, and the cost of each light is less than one farthing per hour.

Can be fixed horizontal, close to, or distant from, the Burner; is ornamental, simple in construction, consisting of a double chamber, the inner perforated, covered with a diaphragm giving action to a spherical valve.

PRICE 3s. EACH.

Can at all times be seen tested at the Manufacturer's,

JOSEPH BOULTON

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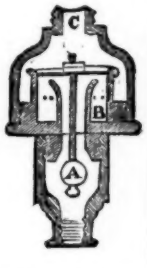

JAMES OAKES and CO.,

ALFRETON IRON WORKS, DERBYSHIRE,

AND

WENLOCK IRON WHARF, 20, WHARF ROAD, CITY ROAD, LONDON,

Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water Works, including best cold-blast Iron Retorts, Socket and Flange Pipes of all sizes, Bends, Branches, Syphons, Lamp Columns of various patterns, &c.

N.B.—Orders for Cast-iron Tanks, Girders, Columns, Cylinders, and all irregular castings, will have immediate attention.

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C. H. is prepared to carry out the warming and ventilation of public buildings, &c.; also civil engineering in general.

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Manufactory—Broad Street, Birmingham—Established 1807,

MANUFACTURERS OF GLASS CHANDELIERS, GLASS LUSTRES, TABLE GLASS, &c. &c.

ELEGANT CRYSTAL GLASS CHANDELIERS, for GAS, from £4 upwards (Made from "REGISTERED" DESIGNS), with GLASS BRANCHES, &c.; suitable for DRAWING-ROOMS and BALL-ROOMS. The more extensive use of Gas in private dwellings has induced MESSRS. OSLER to direct their particular attention to the manufacture of this class of articles—which, with a view to their general adoption, are offered at very moderate prices. Purchasers can select from a great variety of patterns, to which additions are being constantly made.

THEATRES, CONCERT, ASSEMBLY, AND BALL ROOMS LIGHTED BY ESTIMATE ON THE LOWEST TERMS.

ESSON'S PATENT
COMPENSATING GAS-METER

Affords *absolute security* both to Gas Companies and Consumers, by maintaining a *constantly accurate Water-Level under all circumstances*, by means so simple and effective as to baffle and remove those objections which have been successfully urged against other complicated contrivances professing the same object.

MANUFACTURED ONLY BY

WILLIAM COWAN,

Buccleuch Street Works, EDINBURGH;

AND

Commercial Chambers, Ridings Court, St. Mary's Gate, MANCHESTER.

ESTABLISHED 1827.

By Her Majesty's Royal Letters Patent.

JAMES MEACOCK,

PATENT DRY and IMPROVED WET GAS-METER WORKS,

7, SNOW HILL, AND 16, WEST STREET, LONDON.

ESTABLISHED 1836.

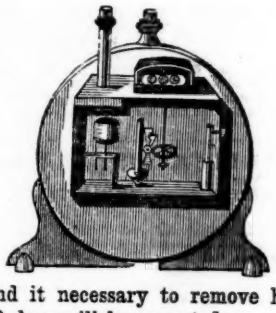
J. MEACOCK begs to call attention to his patent method of securing the Leather diaphragm of his Dry Meter. Instead of using the soldering iron for this purpose, it is held between two flat Metal Rings, and screwed up sound to a metal frame, as shown in the drawing.

By this improvement the perishing effect of hot tools to leather being avoided, its durability must be longer; also, its repair when needful is most simple, as a new leather diaphragm can be applied by merely unscrewing the old one from the rim or frame to which it had been screwed up.

Meters of Gas Companies being subject to so much wear and tear, J. M. begs leave to assure those who may honour him with their commands, that nothing but the stoutest materials for cases, the hardest gas-resisting metals, and best foreign leather for the interiors, will be used, and none but first-class workmen employed in their construction.

Wet Gas-Meters Repaired and Reconstructed with J. Meacock's Modern Improvements.

METERS SENT ON APPROVAL.



In consequence of the great demand for the above Meters, J. Meacock has found it necessary to remove his Manufactory to more extensive Premises, 16, West Street, Smithfield, where Orders will be executed on the shortest notice.

EDWARD COCKEY & SONS'

PATENT GAS VALVES.

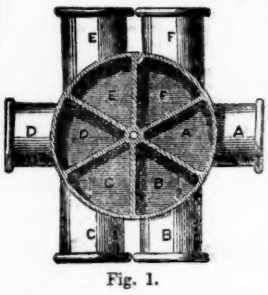


Fig. 1.

THESE Valves are formed of two cast-iron cylinders, with segmental divisions, having faces ground gas-tight, the upper cylinder turning horizontally on the lower one.

The lower cylinder has pipes from each division communicating with the vessels to and from which gas is to be passed. The upper cylinder has corresponding divisions, so arranged as to direct the passage of gas to the different segmental divisions in the lower part, and when it is turned on the face of the lower one to alter the flow of gas from one vessel to another.

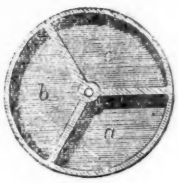


Fig. 2.

Fig. 1 shows the Valve prepared for two purifiers, in which, by turning the upper cylinder, Fig. 2, the Gas is directed to either purifier separately.

Another arrangement is just completed for two purifiers, by which the Gas may be directed through both purifiers together, entering either first, or through either purifier separately. The advantages of this arrangement will be too manifest to Gas Manufacturers to need comment.

The Valves are manufactured by the Patentees at their

IRON WORKS, FROME SELWOOD.

The following Testimonial has been received from an eminent Engineer:—

Gaslight and Coke Company's Office, Cheltenham, Jan. 17, 1859.

Messrs. Cockey and Sons, Frome.

Gentlemen,—The Patent Purifier Centre Valve which I had fixed instead of the common hydraulic valve for one of our sets of purifiers with 9-inch connexions, I am happy to say continues to afford satisfaction both to myself and to the workmen who have the charge of it.

I am, Gentlemen, yours truly, W. ESSON.

EDWARD COCKEY AND SONS

ALSO MANUFACTURE

PURIFIERS, SCRUBBERS, CONDENSERS, AND OTHER IMPROVED GAS APPARATUS,

HAVING PATTERNS SUITABLE FOR GAS-WORKS OF DIFFERENT SIZES.

FIRE-CLAY GAS RETORTS.

ESTABLISHED IN 1795.

JOSEPH CLIFF,

WORTLEY FIRE-BRICK WORKS, near LEEDS.

THESE RETORTS are unrivalled in excellence, being the BEST FINISHED INTERNALLY, and THE MOST CORRECT IN FORM, of any in the Kingdom. From the peculiar composition used in working up the face of the material, they are rendered unusually smooth, close, and FREE FROM SURFACE CRACKS, thus, in a great measure, preventing leakage and the adhesion of carbon to their interior surface.

To meet the yearly increasing demand of UPWARDS OF THIRTY SEASONS and to carry out the late improvements in the manufacture, the Premises have been re-erected and much enlarged, and Engineers may rely WITH CONFIDENCE on their orders being completed with a greater regard to despatch than by any other House.

THE WORKS ARE WELL SITUATED

For EXPORT from the Ports of { LONDON, LIVERPOOL, HULL, MIDDLESBRO', HARTLEPOOL, and STOCKTON.

FIRE-BRICKS, LUMPS, GUARDS, TILES, AND CLAY OF THE SAME QUALITY.

M. B. NEWTON, London Agent, No. 4, Wharf, King's Cross Goods Station.

PADDON and FORD respectfully invite the attention of Gas Companies and Managers to their PATENT STREET LAMP REGULATOR, which ensures any required consumption.

By its use a great saving is effected, and the item of "Unaccounted-for Gas" considerably decreased.

PADDON and FORD, Patent GAS-METER AND APPARATUS WORKS, GRAY'S-INN-ROAD, LONDON,

Manufacturers of WET and DRY GAS METERS, STATION METERS, GOVERNORS, EXPERIMENTAL APPARATUS, LANTERNS, &c. &c.

Contractors for the erection or alteration of Gas-Works; and every description of Apparatus required in Gas-Works supplied.

GEORGE CUTLER, Gasholder MAKER,

No. 8, WENLOCK-ROAD, CITY-ROAD, LONDON.

Contracts for Tanks, Gasholders, Roofs, Purifiers, and all descriptions of Gas Apparatus executed on the most reasonable terms. Improved Slide Valves, Steam, and Range Boilers, and Smiths' Work, of the best materials and workmanship.

"ALL DOUBTS REMOVED."

DEFRIES' celebrated Dry Gas-METERS, of which there are 80,000 in use in Palaces, Churches, Chapels, Royal Dock-yards, Club Houses, Public Offices, and other buildings throughout the Empire, the Continent, and Colonies.

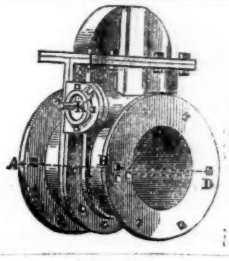
His meter for 1500 lights, in use upwards of ten years at the Royal Italian Opera, until that building was destroyed by fire, was long afterwards dug out of the burnt ruins, then tested by the Chartered Gas Company and found inflexibly correct.

On the 9th of June, 1858, at the Western Gas Company, his meter for 150 lights, after considerable use, was doubted, and subjected to the most variable tests, from the full lighting down to a single jet, and in each case, as in numerous other instances, accuracy was finely indicated.

His two large meters at the Thames Tunnel have been in constant use day and night for upwards of twelve years (one continuation of dark hours), subjected to the wear and tear of 75 years, as compared with the ordinary hours of using gaslight above ground.

Gas Companies honouring Mr. Defries with their commands for his PATENT DRY METER, which has done so much service in simplifying the fitting up of gas, as well as checking surreptitious burning, will be guaranteed perfection for five years free of charge.

Defries' Prize-Medal Gas Baths, Gas-Cooking and Heating Stoves. The Polytechnic Gas Fire, with indestructible fuel, in daily operation (Saturday excepted) at the Office, 406, Euston Road, FITZROY SQUARE, LONDON.



BRYAN DONKIN & CO.

keep always on stock their

IMPROVED GAS VALVES,

from 2 inches to 18 inches, price 11s. 6d. to 13s. 6d. per inch diameter.

List of prices, with full dimensions of all sizes up to 27 inches, to be had on application.

These Valves are all proved to 30 lbs. on the square inch before leaving the works.

BRYAN DONKIN & CO.,

ENGINEERS,

NEAR GRANGE ROAD, BERMONDSEY.

BIRTLEY IRON WORKS, CHESTER-LE-STREET, DURHAM.

Manufactory for every description of Casting and Machinery for Gas Works and Water Works.

Warehouse in London for Cast-iron Pipes and Connections of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

Office in London, MR. E. M. PERKINS, 78, Lombard Street.

HARRIS and PEARSON

PROPRIETORS OF

BEST CLASS-HOUSE POT AND CRUCIBLE CLAY.

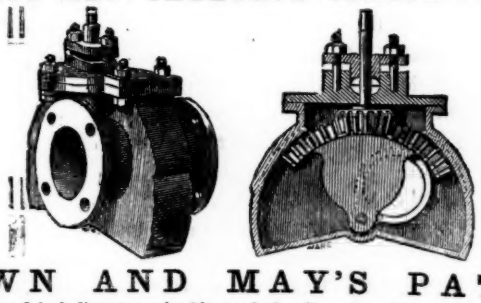
MANUFACTURERS OF

FIRE BRICKS GAS RETORTS &C.

AMBLECOTE FIRE CLAY AND BRICK WORKS, STOURBRIDGE.

Late in the occupation of J. and W. King. Originally J. Pidcock, Esq.

BEST AND CHEAPEST SLUICE-COCK.



BROWN AND MAY'S PATENT.

Above 3-inch diameter, price 10s. per inch. Brass face, 6d. per inch extra.

Can be taken to pieces without being removed from the line of Piping.

NORTH WILTS FOUNDRY, DEVIZES.

Wholesale Agents, Messrs. S. and E. RANSOME, 31, Essex Street, Strand, E.C., Where a Sample may be seen.

WILLIAM INGHAM AND SONS,

WORTLEY FIRE-BRICK AND RETORT WORKS,

Near

Leeds.

W. INGHAM and SONS, having for many years been extensively engaged in the Manufacture of

RETORTS AND FIRE-BRICKS FROM THE CELEBRATED WORTLEY FIRE-CLAY,

beg to call especial attention to their RETORTS, which have for many seasons proved to be unsurpassed in quality by any in the Kingdom, their FREEDOM FROM CRACKS and the ADHESION OF CARBON rendering them worthy the attention of all parties interested in the making of Gas.

The Works are of such magnitude as to ensure the prompt execution of orders to any extent.

Estimates for Setting, or Bricklayers sent when required.

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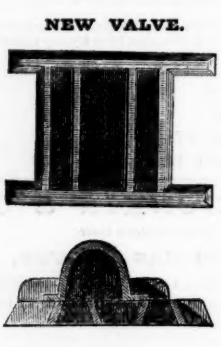

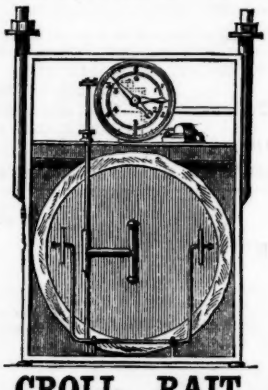

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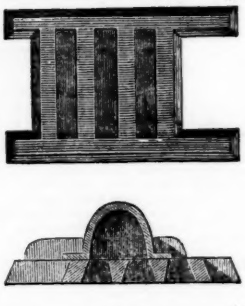

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WILLIAM MANN, Engineer	,,	City of London Gas Company.
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THOMAS LIVESEY, Engineer and Secretary.	,,	South Metropolitan Gas Company.
DAVID HUNTER, Jun., Resident Engineer .	,,	Surrey Consumers' Gas Company.

This opinion is also confirmed by

JOHN KIRKHAM, Civil and Consulting Gas Engineer.
R. M. CHRISTIE ,, ,,
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